THE CREATIVE SELF

Effect of Beliefs, Self-Efficacy, Mindset, and Identity

Edited by

Maciej Karwowski
James C. Kaufman

THE CREATIVE
SELF

————

Explorations in Creativity Research

Series Editor

James C. Kaufman

THE CREATIVE SELF

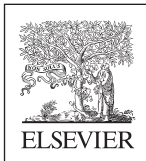Effect of Beliefs, Self-Efficacy,
Mindset, and Identity

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For Edyta, Franio, Kazio and Basia,
My synergy between creativity and the self
Maciej

For Maria Avitia,
Whose resilience, loyalty, brilliance, and kindness
Makes Allison and I so proud
And grateful to have her in our lives
Love, James

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The Nuances and Complexities of Who We Are When We Create: An Introduction to Creativity and the Self

Maciej Karwowski, James C. Kaufman

Libraries of books on creativity have been published over the past century. Beginning a new one by claiming that creativity is a complex phenomenon is not a creative opening. Yet what it lacks in originality, it makes up for with task appropriateness—creativity *is* pretty complex. Over the decades, scholars have theorized and studied its antecedents and consequences, posited and tested psychological and social mechanisms underlying creative thought, and collected dozens of psychological characteristics that today are considered necessary-yet-not-sufficient conditions of creativity. Thanks to these endeavors, we do know much about how divergent and convergent thinking (Cropley, 2006; Guilford, 1967), insight and incubation (Baird et al., 2012; Sternberg & Davidson, 1995), intelligence (Kaufman, 2016; Silvia, 2015), imagination (Khatena, 1975), motivation (Amabile, 1996), and several personality traits (Feist, 1998; Puryear, Kettler, & Rinn, in press) contribute to creativity.

However, there are still holes in our knowledge and understanding of creativity. The goal of this book is to address one such gap by gathering together perspectives on creativity from a slightly different angle than have previous edited volumes. Instead of emphasizing cognitive abilities, personality traits, or social surroundings, our focus is on *the creative self*. More specifically, we built this book around creative self-beliefs, which include our beliefs about our own creativity and creativity as a phenomenon in general. Our creative identity, creative mindset, and ultimately our creative self-efficacy and metacognition are all related yet conceptually distinct constructs that have a tremendous impact on why, how, and what we create. Even more importantly, these conceptual categories can effectively explain *why we do not create*—the times we choose to not engage in creative activity and do not even try to solve problems, leading to a failure to fulfill our creative potential? Creative self-beliefs are a rapidly growing area of research that can have meaning for all levels of practitioners, from teachers to parents to managers.

In psychology, self-beliefs derive from two different theoretical perspectives. The first is grounded in early works of the founding fathers of humanistic psychology (Fromm, 1959; Maslow, 1958; Rogers, 1954) and today represented by writings of positive psychologists (Csikszentmihalyi, 1997; Richards, 2010). This humanistic perspective conceptualizes the formation of identity as a creative process itself. Reciprocally, it posits that creativity may represent a way to self-understanding, self-fulfillment, and self-actualization. In this perspective, a bit metaphorically, human life is considered to be a constant creative process that leads to a complex and stable personality and identity.

The second theoretical line is rooted in sociocognitive psychological theories. Building on Bandura's (1997) seminal theorizing, this approach considers the process of acquiring knowledge about one's self as primarily cognitive, but still influenced by interactions with the social world. Self-efficacy, understood as self-perceived capacity to deal with the task at hand, plays a central role here. Indeed, creativity studies more and more often include creative self-efficacy to help explain differences in creative achievement or ability (Tierney & Farmer, 2002). Apart from creative self-efficacy, the sociocognitive perspective includes related conceptual categories, such as creative self-concept (Kaufman, 2016), creative personal identity (Jaussi, Randel, & Dionne, 2007), creative metacognition (Kaufman & Beghetto, 2013), and creative mindsets (Karwowski, 2014). These constructs have already demonstrated their usefulness as plausible mechanisms underlying creative behavior (Chen, 2016; Karwowski & Lebuda, 2017). The way these constructs interact and relate to each other, however, has been understudied. Several chapters presented herein (including Batey & Hughes, this volume; Beghetto & Karwowski, this volume; Farmer & Tierney, this volume) aim at untangling these complex relations.

Although we would argue that humanistic and sociocognitive perspectives offer the most fruitful and influential ways of conceptualizing creative self-beliefs, there are also obviously other approaches. These include educational perspectives focusing on the structure of self-concepts (e.g., Marsh, 1990), developmental approaches (Eccles, 1983), or cultural psychology's perspective within the field of creativity (Glăveanu & Tanggaard, 2014).

As we developed this book, we invited the most prominent and exciting scholars to consider the role and significance of self-beliefs as to one's own creativity. What is the relationship between different creative self-beliefs? How are they similar and how are they distinct and different? How and when are creative self-beliefs formed? Can creative self-beliefs be strengthened and should they be supported at all? We were fortunate to gather a strikingly diverse, international, and high-quality line-up of leading creativity researchers to join us on this journey.

Within the confines of this seemingly narrow topic, the chapters in the volume are actually quite eclectic. They offer perspectives from the neohumanistic and sociocognitive schools of thought and beyond. They range from critical reviews and summaries of the literature to original empirical research to new proposals for theories and constructs. In the pages to come, you will find comprehensive, cutting edge, and sometimes controversial ideas that—we believe—will stimulate new work on creative self-beliefs.

THE STRUCTURE OF THE BOOK

This volume consists of five sections of four to five chapters each. Section 1, "Broad Considerations," starts with an attempt to identify complex relationships between the main constructs this book is devoted to: creative self-concept, creative self-efficacy, creative identity, and creative metacognition. In the first chapter, Beghetto and Karwowski critically review the current state of the art in creative self-beliefs and propose several new ideas regarding conceptualization, measurement, and future areas of research. They argue that the way scholars (including the chapter's authors) have conceptualized and measured creative self-beliefs may blur important distinctions among these beliefs and thus should be reconceptualized. Beghetto and Karwowski offer several new ideas related to measurement and new research designs that may enrich studies of creative self-beliefs. In Chapter 2, Farmer and Tierney present a comprehensive overview of the research on creative self-efficacy published since their highly cited conceptual paper (Tierney & Farmer, 2002). They focus on the roles creative self-efficacy has played in these studies, be it a correlate or outcome of individual and contextual factors, predictor of creativity-related outcomes, or a moderator and mediator in the presence of other factors. This chapter develops the nomological network in which creative self-efficacy is embedded and posits the role and mechanisms played by this construct in understanding the complex dynamics around creativity. Chapter 3, by Dollinger and Dollinger, reviews past theory and studies to propose a link between identity and creativity. Specifically, they discuss the classic ideas of Erik and Joan Erikson, along with more recent theories and studies that built on their legacy. Dollinger and Dollinger end with several suggestions for identity–creativity researchers. Finally, in Chapter 4, Simonton proposes a formal connection between free will and creativity. Simonton integrates similarities between the constructs of creativity and free will and then presents how creative thought enhances personal freedom.

Section 2, "Living a Creative Life," further explores the issues of creative identity in multiple contexts. In Chapter 5, Barbot and Heuser take a humanistic and developmental perspective and postulate reciprocal relationships between creativity and identity. The authors discuss three

mechanisms by which creativity may contribute to the development of identity: (1) by strengthening the thinking process involved in identity formation, (2) by providing attributes for self-definition that lead to a positive self-esteem, and (3) by giving outlets for "adaptive" self-expression. In Chapter 6, de Valverde, Sovet, and Lubart discuss how creativity can be considered a relevant resource to foster self-construction. The authors discuss the changing nature of the labor market and contemporary world that raise challenges in career counseling and then embed their analyses of creativity and self-development within counseling theories. In Chapter 7, Glăveanu presents the self as multiple and relational. He further describes a theoretical model that localizes the main categories analyzed in this book: creative identity, creative self-efficacy, and creative mindsets in social context. Chapter 8, by Lebuda and Csikszentmihalyi, focuses on the development of eminent creators' self-concept. The authors base their inquiries in qualitative data. They reanalyze classic interviews with eminent creators collected by Csikszentmihalyi years ago and also interpret contemporary interviews with Polish artists and scientists.

Section 3, "Integrating Multiple Constructs," aims at integrating different self-related constructs discussed through this book. In Chapter 9, Pretz and Nelson empirically examine the relationship between self-perceived creativity, creative performance, and other self-related measures. Across two correlational studies, they suggest that the validity of self-perceptions of creativity varies by domain. Specifically, they found that self-perceptions of creativity were more accurate for students interested in the arts, humanities, and social sciences. Chapter 10, by Beaty and Schacter, explores emerging research from psychology and neuroscience on the contributions of self-generated thought and the brain's default network to creative cognition. The authors discuss growing evidence that the default network plays a critical role in creative thought. They discuss the various cognitive functions associated with the default network and focus on understanding how this network may contribute to the production of creative ideas. In Chapter 11, Batey and Hughes systematically review works on individual difference predictors of creative self-beliefs. They conclude that although cognitive ability measures rarely relate to creative self-perceptions, personality plays a consistent role. To guide future research, Batey and Hughes propose a theoretical rationale for individual difference predictors and sketch possible models that relate cognitive ability, personality, and self-perceived creativity. Finally, Hass, Reiter-Palmon, and Katz-Buonincontro present and discuss implicit theories of creativity as being products of social learning. They develop a taxonomy of implicit theories that include self-theories and mindsets and present evidence that implicit theories are not constant across domain boundaries.

Section 4 focuses on more specific considerations related to creative self-beliefs. In Chapter 13, Tang, Hu, and Zhang review the creative self-efficacy

studies conducted on Chinese samples (from mainland China, Hong Kong, Taiwan, and Singapore) and compare the Chinese perspective with the Western view. The authors focus on three core issues: (1) how creative self-efficacy is conceptualized and measured in China; (2) how it is studied in China in both educational and organizational settings; and (3) the specificities of creative self-efficacy of the Chinese in comparison to other cultures. In Chapter 14, Baer calls for a domain-specific analysis of creative self-beliefs. He argues that just as creativity (or lack of it) in one domain does not predict creativity (or lack of it) in any other domain, one's beliefs about one's own creativity need to be domain specific in order to be accurate. Next, in Chapter 15, Silvia, Cotter, and Christensen discuss how ecological momentary assessment methods can inform studies of everyday creativity. They review research designs and methodological issues for readers interested in conducting momentary assessment and provide advice for future studies. In Chapter 16, Randel and Jaussi focus on the role of uniqueness in creativity, with particular attention to leaders' role in facilitating creativity by capitalizing on individual need for uniqueness. They explore ways in which leading with uniqueness in mind differs from traditional leadership, discuss personal and organizational challenges leaders might confront in encouraging uniqueness, posit how leaders might activate their followers' needs for uniqueness, and then consider how uniqueness might be involved in different forms of creativity. They also discuss the role of national culture and measurement issues. Finally, the last contribution in this part is Chapter 17, by Preiss and Cosmelli. They discuss how creative writers develop a sense of identity and what role is played by mind wandering. The authors postulate a *mindful mind-wandering* category as a synergistic phenomenon that links two potentially opposite psychological mechanisms—mind wandering and mindfulness. Using interviews with acclaimed Chilean writers, Preiss and Cosmelli explore the role mind wandering can play in the development of creative self.

Section 5 consists of five chapters devoted to new models relevant for creative self-beliefs literature. In Chapter 18, Luria and Kaufman focus on the concept of creative needs, defined as a lifelong fusion of values, interests, and passion. They propose and briefly discuss six potential creative needs: Beauty, Power, Discovery, Communication, Individuality, and Pleasure. Djikic and Oatley, the authors of Chapter 19, present their Weary Voyager Model to show how different configurations of selfhood may oppose creativity. Djikic and Oatley discuss ways to improve creativity by reducing self-deception and unnecessary weights of the Narrative Self and Experiential Self. In Chapter 20, Ivcevic and Nusbaum argue that the success of transforming creative ideas into accomplishments depends on effective self-regulation processes. They adapt and extend social psychological research on self-regulation and define two broad groups of self-regulation processes in creativity: (1) revising and restrategizing and (2) sustaining and maintaining effort. They then discuss the role and

mechanisms played at different stages of creative processes. The final chapter, Chapter 21, by Karwowski and Brzeski, explores the most important theoretical questions related to the current state of the research of creative mindsets and discusses future directions of these studies. The authors discuss the importance of mindsets and their place in creative self-belief network. They explain why previous studies identified two separate mindsets rather than fixed-growth continuum and then explore potential cultural and socialization influences on mindsets to finally recommend future areas of inquiry.

We believe that this rich collection of thought-provoking essays opens, rather than concludes, creative self-belief inquiries. We hope that the ideas presented within the pages of this volume will stimulate discussions inside and outside creativity literature and inspire future researchers to develop even more creative solutions to exploring creative self-beliefs. Keeping in mind their importance for all levels and forms of creativity—from mini-c problem-solving to the paradigm-changing Big-C creative achievement—we expect that this line of research will flourish. We would be delighted if this volume informs future studies and encourages new generations of creativity researchers to answer these questions and pose their own.

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BROAD CONSIDERATIONS

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1

Toward Untangling Creative Self-Beliefs

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Terminological infelicities have a way of breeding conceptual confusion
Davidson (2001, p. 154)

During the past decade, creative self-beliefs have garnered a great deal of attention in the creative studies literature. Three key self-beliefs that researchers have focused on during the past several years include the following: *creative self-efficacy* (CSE, i.e., perceived confidence to creatively perform a particular task), *creative metacognition* (CMC, i.e., beliefs based on a combination of creative self-knowledge and contextual knowledge), and *creative self-concept* (CSC, i.e., general beliefs about one's creative abilities). Researchers view these (and related[a]) self-beliefs as shaping one's creative identity (CI; Karwowski & Barbot, 2016) and have further asserted that they play a key role in determining whether a person will engage in creative performance opportunities, sustain effort when faced with challenges, and ultimately, demonstrate higher levels of creative achievement (see also Bandura, 1997; Farmer & Tierney, this volume; Hsu, Hou, & Fan, 2011; Tierney & Farmer, 2002, 2011).

Although the development of positive self-beliefs can be viewed as a desirable outcome in its own right (Beghetto, 2010; Karwowski, 2016; Mathisen & Bronnick, 2009), a key question is whether creative

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[a]A more thorough discussion of related beliefs is beyond the scope of the present chapter. We therefore refer readers interested in related beliefs to work on creative personal identity, creative role identity (Jaussi, Randel, & Dionne, 2007; Karwowski, Lebuda, Wiśniewska, & Gralewski, 2013), and creative mindsets (Karwowski, 2014; see also Hass, Reiter-Palmon, & Katz-Buonincontro, this volume; Karwowski & Brzeski, this volume).

self-beliefs predict actual creative performance. Research on this is-
sue has yielded promising, but somewhat variable results ranging from
virtually zero to moderately positive associations between self-beliefs
and actual creative performance (Beghetto, Kaufman, & Baxter, 2011;
Furnham & Bachtiar, 2008; Furnham, Batey, Anand, & Manfield, 2008;
Karwowski, 2011). These mixed results are found not only across studies
but also within studies (e.g., Kaufman, Beghetto, & Watson, 2015; Pretz &
McCollum, 2014).

What might account for these variable and somewhat underwhelming
results? One possibility is that self-beliefs play a less important role in
creative performance than what many researchers think. Although this is
a possibility that warrants further exploration, we would argue that there
is a more fundamental issue at play: lack of clarity in how creative self-
beliefs have been conceptualized and measured.

Specifically, we would argue that the way researchers (including our-
selves) have conceptualized and measured creative self-beliefs, may blur
important distinctions among these beliefs. In making this claim, we are
not casting dispersions on previous work, but rather attempting to clarify
and refine how we conceptualize and measure such beliefs. This is par-
ticularly important given the continued and growing interest in studying
creative self-beliefs. Doing so requires that we take a step back and focus
on clarifying theoretical similarities and differences among these beliefs.
This is the aim of this chapter.

A SYSTEM OF BELIEFS

Prior to discussing how these beliefs differ, we first highlight how
they work together (Fig. 1.1). More specifically, we assert that CSE, CMC,
and CSC work together as a system of beliefs that helps to shape one's
CI (Beghetto, 2013; Beghetto & Dilley, 2016; Karwowski & Barbot, 2016;
Karwowski & Lebuda, 2016, 2017; Tierney & Farmer, 2002). Indeed, these
beliefs play a role in influencing whether a person will engage with (or
avoid) a particular performance opportunity (CSE, CMC), sustain effort
(CSE, CMC), perform at a particular level of creative achievement (CSE,
CMC), and ultimately judge themselves as creative in various performance
domains (CSC) and as a creative person (CI).[b]

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[b]A more detailed discussion of CI—how it develops and the role that self-beliefs play in
its development—is beyond the scope of this chapter. We mention CI here to indicate that
creative beliefs are not disjointed psychological ephemera, but rather integrated into a
larger, more robust system. We refer readers interested in CI to the recent and excellent
reviews and discussion presented in this volume by Dollinger and Clancy Dollinger (this
volume), Barbot and Heuser (this volume), and Glăveanu (this volume).
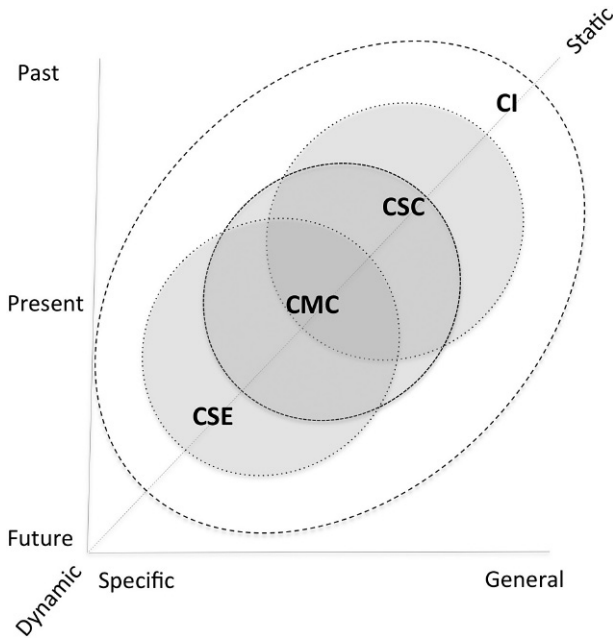
FIGURE 1.1 **Visual relationship among creative identity (CI), creative self-efficacy (CSE), creative metacognition (CMC), and creative self-concept (CSC) across three dimensions: temporal (past, present, and future), stability (dynamic vs. static), and task (specific vs. general).**

Importantly, as illustrated in Fig. 1.1, these beliefs also differ across various dimensions: temporal (past, present, and future), stability (dynamic vs. static), and task (specific vs. general). Recognizing how these beliefs are similar and different from each other can help provide clarity in how these beliefs can be conceptualized and measured (Table 1.1).

In the sections that follow, we expand on the summaries presented in Table 1.1, in an effort to clarify how these beliefs are conceptually distinct, highlight key areas of conceptual overlap, and offer our recommendations for researchers interested in revising or developing new measures that are aligned with these conceptualizations.

DEFINITIONS AND DISTINGUISHING DIMENSIONS

Creative Self-Efficacy

CSE refers to a person's perceived confidence to creatively perform a given task, in a specific context, and at a particular level. As depicted in Table 1.1, CSE beliefs are focused on perceived confidence and are the most

TABLE 1.1 Creative Self-Beliefs: Definitions, Dimensions, and Measurement Suggestions

Construct	Working Definition	Central Focus	Temporal Dimension	Task Dimension	Stability Dimension	Measurement Suggestions
CSE	*Perceived confidence to creatively perform a given task, in a specific context, at a particular level*	*Confidence (i.e., perceived confidence to creatively perform a particular task)*	*Future (i.e., focused on judging one's ability to creatively perform an impending task)*	*Highly specific (i.e., influenced by specific features of a particular task and context)*	*Dynamic (i.e., dynamic self-belief that varies as a function of perceived features of a particular task, context, and psychological and physiological state)*	*Measures of CSE should have a future orientation, focus on perceptions of confidence in performing key features or levels of task performance, and use broad response scales (e.g., 0–100)*
CMC	*Self-beliefs based on a combination of creative self-knowledge (i.e., belief about one's creative strengths and weaknesses) and contextual knowledge (i.e., beliefs about when, why, and how to be creative)*	*Accuracy and regulation (i.e., accuracy of perceived creative strengths and weaknesses and regulatory beliefs related to creative task performance)*	*Present (i.e., focused on judging whether creative performance is warranted and feasible and whether adjustments are needed while engaged in a task)*	*Moderately specific (i.e., influenced by a combination of specific task features, prior self and contextual knowledge, and current task performance)*	*Moderately stable (i.e., somewhat stable self-belief, but can vary depending on changing features of the context and task performance)*	*Measures of CMC should dynamically measure both accuracy and regulatory beliefs, account for confidence bias and task difficulty, and assess recalibrations of beliefs across multiple trials*
CSC	*Creative self-belief based on holistic cognitive and affective judgments of creative ability in and across particular domains*	*Competence (i.e., perceived creative competence in a domain)*	*Past (i.e., focused on holistically judging one's domain-specific creative ability based on prior performance)*	*General (i.e., influenced by the accrual of self- and social- judgments of prior creative performance in a particular domain)*	*Stable (i.e., generally stable self-belief that changes overtime as a result of aggregate performance appraisals and feedback)*	*Measures of CSC should focus on retrospective self and social perceptions of competence and assess both cognitive and affective features of CSC*

CSE, Creative self-efficacy; CMC, creative metacognition; CSC, creative self-concept.

I. BROAD CONSIDERATIONS

future-oriented, task-specific, and malleable of the three self-beliefs discussed herein. CSE beliefs are triggered when a person encounters a performance situation. This, in turn, results in a self-judgment about one's confidence to creatively perform an impending task at a particular level (e.g., "I am confident that I can creatively solve three of these five problems").

CSE beliefs, like all efficacy beliefs (Bandura, 1997), play a role in determining whether a person will attempt to engage with or avoid a task. Efficacy beliefs also play a role during task engagement (e.g., helping to determine whether a person will sustain effort when facing difficulty with a task), as well as following task engagement (e.g., recalibrating one's confidence in the ability to perform similar tasks in the future).

There are various factors that can influence efficacy beliefs. Indeed, as Bandura (1997) has explained, efficacy beliefs are dynamically shaped by a person's prior performance history with similar tasks, as well as the sociopsychological circumstances of the performance setting, including one's physiological state (e.g., feeling tired vs. energized), social persuasion (e.g., receiving encouragement from trusted sources), and vicarious experiences (e.g., performance of relatable models).

We assert that there are various other sociopsychological and material features of the performance setting (Beghetto, 2017; Glăveanu, this volume; Glăveanu & Beghetto, 2016) that can dynamically influence CSE beliefs, including the creative affordances recognized by the material objects in the environment (e.g., coming up with different uses for a can vs. a brick[c]), current and prior relational histories with people in the environment (e.g., a bully), and even dialogical features (e.g., inner dialogues with real or imagined interlocutors).

Creative Metacognition

CMC refers to a combination of beliefs based on one's creative self-knowledge (i.e., knowledge of one's creative strengths and limitations) and contextual knowledge (i.e., knowing when, where, how, and why to be creative) (Kaufman & Beghetto, 2013). As noted in Table 1.1, CMC beliefs are focused on making accurate self and situational appraisals *and* regulating creative behavior while engaged in an activity. More specifically, CMC beliefs help people judge whether creative performance is warranted and feasible in light of one's self-assessed strengths and features of the current situation.

[c]A bit more explanation here may be helpful to illustrate how material features of a situation can influence self-beliefs. In the case of multiple uses of an aluminum can versus a brick, a person may recognize that a can is more malleable than a brick (e.g., bent, twisted, reshaped) and therefore may lend itself to more uses than a brick, which is more fixed and difficult to transform.

In this way, CMC beliefs tend to have a present moment orientation and are moderately specific and stable. These beliefs are moderately specific because a person appraises and regulates their specific task performance based on a combination of more general self and contextual knowledge that the person views as relevant for the particular situation (e.g., prior performance on similar tasks; knowledge of general strategies, techniques, or principles). CMC beliefs also tend to be moderately stable because they are formed by more constant aspects of the self (e.g., self-appraisals of prior performance), but can change in light of the more dynamic and unexpected features of a particular situation.

CMC beliefs are triggered when a person confronts a performance situation and serve as the basis for appraising the feasibility (e.g., "I am highly confident that I can solve this problem in a creative way") and appropriateness (e.g., "It's worth the risk to try a creative approach to this problem") of creatively engaging with the situation. CMC beliefs also play a role during task engagement (e.g., "This isn't working, I need to try something different") and can result in the recalibration of self and task appraisals based on changing conditions of the situation (e.g., "I'm running out of time, I don't think I'll be able to creatively solve this problem") or performance on the task (e.g., "This task is more challenging than I thought"). In this way, CMC beliefs can overlap with CSE beliefs with respect to judging feasibility prior to and during task engagement (i.e., confidence in one's ability to creatively perform in a particular situation). CMC beliefs also overlap with CSC beliefs in that they inform and are informed by one's general self-judgment of creative ability.

Although CMC beliefs overlap with CSE and CSC beliefs, CMC beliefs are, arguably, the most complex of the three self-beliefs discussed herein. This is because they reflect a combination of self-awareness and creative self-regulation. With respect to creative self-awareness, CMC involves being able to accurately assess one's creative strengths and weaknesses and thereby influences and is influenced by the accuracy of one's CSE and CSC beliefs. With respect to creative self-regulation, CMC beliefs influence one's ability to make strategic decisions in a particular situation. This requires drawing on knowledge of the self and situation to determine whether, when, and how to act in a creative way (Kaufman & Beghetto, 2013).

Creative Self-Concept

CSC refers to a general cognitive and affective judgment of one's creative ability. Although CSC beliefs represent more general perceptions as compared to CSE (and CMC), this does not mean that CSC beliefs are restricted to domain-general beliefs (e.g., "I am creative"). Indeed, researchers who have studied self-concept in other fields (Bong & Skaalvik, 2003) assert that self-concept can be assessed using domain-specific measures.

What differentiates CSC beliefs from CSE beliefs is not that CSC beliefs are domain general, but rather pertain to more global perceptions of competence in a domain (e.g., "I am a creative dancer"; "I am a creative writer"), whereas CSE beliefs represent more particular perceptions of confidence in one's ability to creatively perform particular tasks (e.g., "I am confident that I can write a creative tall-tale about my 10th birthday").

CSC beliefs also differ from CSE and CMC beliefs in that CSC beliefs are based on a combination of affective (e.g., "I like creative writing") and cognitive (e.g., "I am a good creative writer") self-appraisals of competence (Bong & Skaalvik, 2003). This is not to say that emotion plays no role in CSE or CMC beliefs, but rather that CSE and CMC beliefs tend to have more of a cognitive orientation. Moreover, CSC beliefs tend to be based on more generally focused social comparisons (e.g., "Compared with other students in my class, I am good at creative writing) and appraisal feedback from others (e.g., "I have been told I am a creative writer"), whereas CSE beliefs tend to be focused more directly on the specific performance features of a task. Again, this is not to say that CSE or CMC beliefs are not influenced by social comparisons or social persuasion, but rather that CSC beliefs are influenced by more generally focused social influences (Bong & Clark, 1999).

CSC beliefs are also retrospective, rather than prospective (CSE) or focused on real-time appraisals (CMC). CSC beliefs also tend to be more stable than CSE or CMC beliefs, because they are based on aggregate judgments across time. It is, of course, possible that a single, critical incident can alter one's CSC—particularly for young people who are in the early stages of developing their creative competence (Beghetto & Dilley, 2016). Generally speaking, however, we assert that CSC is more of a trait-like belief and less volatile than CSE or CMC beliefs.

Taken together, these three self-beliefs influence a person's creative identity (CI), general (or trait-like) assessments of creative abilities (CSC), self and task appraisals of the feasibility and appropriateness of creatively engaging with particular situations (CMC), and more specific (or state-like) confidence in creatively performing particular tasks, at particular times, in particular contexts (CSE). Given that these beliefs have conceptually shared and distinct features, they present researchers with nontrivial measurement challenges. In what follows, we offer suggestions for how creativity researchers can develop more precise measures of these three creative self-beliefs.

MEASURING SELF-BELIEFS: RECOMMENDATIONS AND NEW DIRECTIONS

As we noted in our introduction, previous work examining the relationship between creative self-beliefs and creative performance has yielded heterogeneous and somewhat underwhelming results. We also asserted

that these findings likely have been constrained by the way we (and other creativity researchers) have measured CSE, CMC, and CSC. In this section, we offer specific suggestions for how creativity researchers might develop more sensitive measures of each of these beliefs. We close this section by outlining a few general measurement recommendations.

Measuring Creative Self-Efficacy

When it comes to measuring CSE, researchers will need to modify existing (or develop new) measures to elicit a person's prospectively focused confidence in creatively performing a particular task, at a particular level, in a particular context. Indeed, as self-efficacy researchers in other fields have asserted (Bandura, 1997; Bong & Skaalvik, 2003; Pajares, 1996; Zimmerman, 2000), a key requirement for measuring self-efficacy beliefs is that they are tailored to elicit a person's confidence in performing specific features of a task (e.g., "I am confident I can correctly spell all the words that I will use in my three page essay"; "I am confident I can run a mile in under ten minutes"; "I am confident I will score above an 80% on this math exam").

We therefore have the following recommendations for researchers interested in modifying existing or developing new measures of CSE:

- *Future orientation*: CSE measures should have a future orientation. This orientation should be made explicit in how items are worded (e.g., "I am confident that I *will* …") and when the CSE beliefs are assessed (i.e., *prior* to engaging in a performance). Depending on the particular goals of a study, the future orientation may have an immediate focus or more distal focus. Although we might expect less accurate judgments with more distal predictions of creative performance, researchers may yield important insights into factors that contribute to more or less accurate CSE predictions when examining both proximally oriented and distally oriented CSE beliefs.
- *Perceptions of confidence*: CSE measures should elicit respondents' perceptions of their confidence (e.g., "How *confident* are you that you can …") and not their competence (e.g., "I am good at …"). We recommend making this clear in the measurement instructions provided to respondents in studies of CSE, as well as the items written to assess these beliefs.
- *Key features or levels of task performance*: CSE measures should focus on key performance features of a particular task (e.g., "… creatively use internal rhymes when writing my poem") or different levels of task performance (e.g., "… creatively solving three of these five ill-defined problems"). Again, we recommend clarifying this focus in how items are written and the instructions provided to research participants.

- *Use broader-ranging response scales*: CSE measures should use scales that have a longer range of responses (e.g., 0–100, per the recommendation in Bandura, 2006). This can help avoid range restriction and potentially inflated self-ratings and, instead, offer more sensitive, reliable, and accurate predictions (Bandura, 2006; Pajares, Hartley, & Valiante, 2001).

Our recommendations differ from how we (and other creativity researchers) have typically measured CSE in prior studies (e.g., Beghetto, 2006; Karwowski, 2011, 2012; Pretz & McCollum, 2014; Tierney & Farmer, 2002). Indeed, we have typically measured CSE using items that assess more trait-like or global beliefs (e.g., "I have a good imagination") with short response scales (e.g., 5-point Likert scales). We now recognize that more global and shorter-response measures may provide limited insights into CSE beliefs and, in turn, constrain the predictive power of traditionally measured CSE beliefs.

We therefore have started implementing our CSE measurement recommendations in some of our more recent work (e.g., Karwowski & Beghetto, in preparation; Karwowski, Gralewski, & Szumski, 2015). In these initial efforts, we have expanded the range of response scales (e.g., 1–100), focused respondents to report on their perceived confidence prior to performing specific tasks, and attempted to more tightly align CSE measures with specific tasks. We plan to expand on such efforts, in subsequent studies, by assessing CSE in relation to specific levels of task performance and by comparing the predictive validity of updated CSE measures in relation to more traditional measures of CSE. We invite researchers to join us in this line of work by developing studies that implement, test, and refine our CSE measurement recommendations.

Measuring Creative Metacognition

There are two aspects of CMC that researchers need to take into account when measuring CMC: *accuracy* of performance appraisals and *regulation* of behavior. We define metacognitive accuracy as the relationship between a person's level of confidence in performing a task and that person's actual level of performance—yielding four possibilities (see also Fleming & Lau, 2014[d]): high confidence, high performance (accurate high alignment); high confidence, low performance (inaccurate overestimation); low confidence, high performance (inaccurate underestimation); and low confidence, low performance (accurate low alignment). Consequently, a person

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[d]Our definition and conceptualization of metacognitive accuracy differs somewhat from metacognitive sensitivity as described by Fleming and Lau (2014) and we therefore refer interested readers to their excellent discussion of metacognitive sensitivity as well as their measurement recommendations.

with high metacognitive accuracy is someone who demonstrates significantly higher frequency of accurate judgments (i.e., creative confidence matches creative performance) as compared to inaccurate judgments (i.e., creative confidence does not match creative performance).

Metacognitive regulation refers to a person's ability to make adjustments to their beliefs and behaviors during and after task performance. Given the goals of this chapter, we limit our focus to regulatory beliefs.[e] Examples of such beliefs include a person believing that he or she needs to increase (or decrease) effort, try a different strategy, or persist with (or withdraw from) a task. Another way of examining regulatory beliefs is to assess whether people recalibrate their confidence beliefs (i.e., CSE) while engaging with and completing a task and whether those recalibrations increase or decrease metacognitive accuracy.

We have the following recommendations for researchers interested in measuring CMC beliefs:

- *Measure accuracy and regulatory beliefs.* When designing studies assessing CMC beliefs, we recommend that researchers assess both metacognitive accuracy and metacognitive regulation. Although important insights into CMC can be gained by assessing only one of these facets, we argue that a more complete understanding of CMC beliefs can be gained from studies that measure both metacognitive accuracy and metacognitive regulation.
- *Use CSE when measuring metacognitive accuracy.* Given that measuring metacognitive accuracy involves eliciting respondents' perceived confidence, researchers should use measures of CSE (as described in the previous section) as their assessment of confidence. We recognize that other proxies and measures of confidence can be used, but given our assertion that CSE is part of an overall system of self-identity beliefs, we recommend using CSE as the preferred measure of confidence.
- *Account for confidence bias and task difficulty.* When measuring metacognitive accuracy, two additional issues need to be assessed: confidence bias and task difficulty. As Fleming and Lau (2014) note, confidence bias (e.g., an overly cautious or humble person consistently underestimates confidence level on tasks regardless of task performance) and task difficulty (e.g., easier tasks tend to be judged more accurately) can result in erroneous conclusions with respect to a person's metacognitive accuracy. We refer readers to Fleming and Lau (2014) for a discussion of analytic techniques that may prove useful in studies of CMC.

[e]Metacognitive regulation of behaviors can, for instance, be assessed using observational measures. Given our focus on beliefs in this chapter, we do not discuss observational methods or measures. We urge researchers to develop ways to measure both beliefs and behaviors when assessing CMC regulation.

- *Use dynamic, real-time measures.* When measuring regulation beliefs, creativity researchers likely would benefit from using experience sampling methods (Conner, Tennen, Fleeson, & Barrett, 2009) and other relevant techniques, such as ecological momentary assessment (see Shiffman, Stone, & Hufford, 2008 for an overview), to assess people's perceptions of tasks and their ability to creatively perform those tasks in real time.
- *Assess recalibrations of confidence.* We recommend assessing changes in confidence before, during, and after having completed a task. This will allow researchers to more dynamically assess regulation in relation to metacognitive accuracy.
- *Use multiple trials and microlongitudinal designs.* Given that metacognition involves regulation, it is important to measure how performance outcomes influence recalibration of CMC beliefs over multiple trials of performance tasks.

Research on CMC beliefs is in the early phases[f] and there are only a few studies that have attempted to explore this construct. Initial efforts (e.g., Kaufman et al., 2015; Pretz & McCollum, 2014) have focused primarily on metacognitive accuracy (i.e., associations between self-beliefs and external performance ratings) and, as noted earlier, have yielded somewhat mixed and modest results. Similar to prior work on CSE, previous work on CMC is somewhat limited by the types of measures and methods used. Still, the findings from initial CMC studies serve as an important point of comparison for researchers interested in using and testing out our recommendations. It will be important to explore whether and how revised CMC measures perform in comparison with previously used measures. We therefore urge researchers to design studies that will compare, test, and further refine our recommendations for assessing CMC beliefs.

Measuring Creative Self-Concept

When it comes to measuring CSC, researchers should develop measures that assess people's general beliefs about their creative abilities. These measures should also be based on a respondent's retrospective and social-comparative appraisals of competence. As noted earlier, this does not mean that items should be restricted to domain-general appraisals,

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[f]Just to provide a bit of context, we conducted a brief search of the three beliefs discussed herein as a way to provide a rough estimate of the relative popularity and focus placed on each of these three beliefs. As of this writing, a quick Google search yielded more than 20,000 hits related to CSE (as compared to nearly 10,000 hits for CSC and slightly more than 1000 hits for CMC). An even more disproportionate ratio was yielded when conducting the same search using Google Scholar (slightly more than 2500 hits for CSE, 158 for CSC, and 94 for CMC).

but rather focus more on cognitive, affective, and social-comparative appraisals of creative competence.

We have the following recommendations for researchers interested in designing new (or revising existing) items to assess CSC:

- *Focus on retrospective, general perceptions of competence.* Items assessing CSC should focus on retrospective, general perceptions of creative competence. This would include developing items that represent more global self-appraisals (e.g., "I am a creative dancer") as well as highlight the specific retrospective and aggregate nature of CSC beliefs (e.g., "As I reflect on all my experiences as a dancer, I would consider myself a creative dancer").
- *Measure both cognitive and affective self-appraisals.* Given that CSC beliefs have both *cognitive* features (e.g., "I am good at coming up with creative solutions when solving math problems") and *affective* features (e.g., "I enjoy coming up with creative solutions when solving math problems"), we recommend that researchers develop items that assess both of these facets of CSC. Following Bong and Skaalvik (2003), we also recommend that these features be measured in a way that allows researchers to examine the dimensionality of these two facets (e.g., developing enough items to treat CSC-affect and CSC-cognitive as separate, but interrelated scales).
- *Include social comparisons and perceptions of external appraisals of competence.* Given that self-concept beliefs represent an aggregate appraisal of creative competence—which includes social comparison and social feedback—we recommend that researchers include items in their CSC measures that generally assess social comparisons of creative competence and self-reported social feedback about creative competence (e.g., "Compared to other people my age, I am good at creatively solving problems"; "Other people have told me I am good at creatively solving problems").
- *Measure CSC beliefs in and across domains and over time.* As we have discussed, CSC beliefs tend to be more general (i.e., less focused on specific features of tasks or actions) and stable (i.e., less likely to change based on contextual features or singular experiences) as compared to CSE and CMC beliefs. Importantly, however, this does not mean that measurement of these beliefs should be restricted to domain-general perceptions (e.g., "I am creative"). We therefore recommend that researches measure these beliefs in and across domains and over time to examine whether and how such beliefs differ and change over time.
- *Use different types of response scales.* Given potential problems with common method variance in studies of self-beliefs, we urge researchers to explore different ways of measuring CSC, including

different types of response scales (including but not limited to Likert-type scales). An example of how self-concept has been measured in other fields (e.g., Bong & Skaalvik, 2003; Harter & Pike, 1984), which could be applied to CSC, involves the following: (1) providing respondents with two contrasting statements on opposite sides of the page (e.g., "Some people are good at coming up with creative solutions to math problems"; "Other people are not good at coming up with creative solutions to math problems"), (2) asking respondents to select which statement best describes them, (3) asking respondents to indicate how true that statement is for them (e.g., very true, somewhat true), and finally (4) calculating a score, ranging from 1 to 4, for each item (e.g., 1 = selecting "other people are not good at …" *and* selecting "very true"; 4 = selecting "some people are good at …" *and* selecting "very true"). This approach is just an example of one alternative approach to traditional Likert scale items that creativity researchers might use when measuring CSC.

At this point, it should be clear that the way we (and other creativity researchers) have previously measured creative self-beliefs—in particular CSE (e.g., Beghetto, 2006; Karwowski, 2011, 2012; Tierney & Farmer, 2002)—has likely confounded CSE with CSC. Indeed, given that traditional scales of CSE have lacked contextual and task specificity, such measures likely have assessed respondents' more general (or CSC) creative competence beliefs rather than their CSE beliefs (i.e., perceived confidence to creatively perform a given task, in a specific context, at a particular level). Indeed, a recent meta-analysis (Karwowski & Lebuda, 2016) has convincingly demonstrated that while domain-specific, situational creative self-beliefs are to a large extent independent from personality, more-CSC-like or domain-general beliefs are almost synonymous with a personality meta-factor of plasticity (composed of openness and extraversion).

We thereby suggest that researchers, who are interested in using traditional CSE scales in their research, alert readers to the potential issues with the use of traditional CSE measures.[g] We also suggest that researchers engage in the empirical work necessary to examine whether and how findings from traditional CSE scales differ from updated measures of CSE and updated measures of CSC (i.e., designed according to our recommendations presented herein). Indeed, given the conceptual overlap between self-efficacy and self-concept, it is possible that in some situations more general CSC measures will yield essentially the same pattern of results as more task- and context-specific CSE measures. Again, this is a claim that requires empirical testing.

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[g]It would also be helpful for researchers to clearly denote differences between traditional CSE measures and revised CSE measures by using a simple notation in the way the scales are labeled (e.g., tCSE, traditional CSE measure; rCSE, revised CSE).

General Recommendations for Measuring CSE, CMC, and CSE

Having outlined several specific suggestions for measuring each of the three self-beliefs, we turn our attention to providing some general recommendations.

Design Studies that Measure All Three Beliefs

In light of what we discussed in the previous sections, we would recommend that researchers design studies that include measures of all three beliefs. This is particularly important when designing studies that explore the role that such beliefs play in predicting creative performance. Doing so will help clarify how these beliefs work together in particular performance situations and can also help clarify direct, mediating, and moderating influences of these beliefs on creative performance (see also Karwowski & Barbot, 2016).

Consider, for example, a person who has little or no familiarity with a task. In such a case, we would expect a high degree of overlap between CSE and CSC, with more variability in CSE and CMC judgments during the duration of task engagement. Continuing with this example, if a person lacks relevant task-specific experiences (e.g., "I have no experience trying to creatively solve a math problem like this *particular* one"), then we would expect that person to appeal to his or her more global CSC belief in that situation (e.g., "… I'm generally good at coming up with creative solutions to math problems"). In this way, differences in CSC and CSE would likely be negligible.

Moreover, we would expect that the person's CMC accuracy (based on the initial CSE judgment) would also be lower. We would also expect variability in metacognitive regulation if the person decided to engage with the task. If, for instance, the task proved to be more difficult than expected, the person might come to believe that the effort is not worth it and thereby disengage with the task. This, in turn, may result in a recalibration of his or her CSE belief about this particular type of task (e.g., "I'm not confident I can creatively solve this kind of math problem"). Alternatively, a person with an exaggerated sense of CSE/CSC might believe that successful performance is possible and thereby persist with the task. Assuming a negative performance outcome, the person may ignore the outcome and in essence buffer his or her CSE/CSC beliefs from a more accurate downadjustment (Kruger & Dunning, 1999).[h] Depending on the intensity or the frequency of similar

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[h]We would argue that enhanced or exaggerated self-beliefs are not always a problem. In the case of young people developing their competence in a domain, such exaggerated self-beliefs may help them persist in developing their competence and eventually recalibrating their beliefs to align with their actual level of performance. Importantly, just because a belief is exaggerated—particularly in a "one-shot" rating situation—does not mean that it will continue to be inflated over multiple trials or the creative life span. Indeed, as Fleming and Lau (2014) note, one-shot ratings are not reliable and researchers therefore need to examine CMC judgments across multiple trials.

negative outcomes, however, we would argue that it would eventually have a negative impact on a person's CSE, CSC, and even CI (e.g., "Maybe I'm not as creative at solving math problems as I thought I was").

As the earlier example illustrates, similarities and differences among creative self-beliefs can differ depending on the performance situation. Indeed, each of the three self-beliefs can play different background and foreground roles prior to, during, and after engaging in performance tasks. We therefore urge researchers to examine whether and under what conditions measures of CSC and CSE serve as proxies for each other, when they substantially differ, and how the beliefs work together across the shorter time span of task engagement and the longer time span of CI development. Such work will help provide further conceptual and empirical clarity on these creative self-beliefs.

Test Domain Specificity of Self-Beliefs Using More Robust Methods

Although previous work has suggested that creative-self beliefs seem to be domain-specific (e.g., Baer, this volume; Kaufman et al., 2015; Pretz & McCollum, 2014), we recommend that researchers further test domain specificity using more robust analytic techniques. Correlational analysis may be considered the most natural method for testing domain specificity (e.g., if correlations among self-beliefs are low across domains, then there is evidence of domain specificity). Although a correlational approach is intuitively appealing, it can serve only as tentative evidence in making claims about domain specificity. As we have discussed, self-beliefs typically have been measured using a few items with short response scales (e.g., 5-point Likert scales) and thereby the reliability of such scales may be limited. Consequently, what may initially seem like lower correlations between measures of self-beliefs across domains may actually be substantially higher once corrected[i] for attenuation and restricted variability (and, instead, provide evidence for domain generality).

We thereby suggest that creativity researchers use more robust methods to test whether creative self-beliefs are domain general or domain specific. Two promising analytic techniques used by creativity researchers include latent class analysis (LCA) (e.g., McKay, Karwowski, & Kaufman, in press; Silvia, Kaufman, & Pretz, 2009) and confirmatory factor analysis (CFA), using a bifactor scheme (Barbot, Besancon, & Lubart, 2016). These two

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[i]Here is a quick illustration. Assume that we obtain $r = 0.30$ for measures of self-beliefs in two different domains. Given that this relationship accounts for only 9% of variance, we might feel justified in asserting domain specificity of these beliefs. However, if the reliability of both self-assessments is moderate (assume $\alpha = 0.60$), then a correction for attenuation (Thorndike, 1949) could increase the correlation from $r = 0.30$ to 0.50. Going further, if the variability is restricted by ceiling effect (e.g., obtained variance is twice lower than could be expected), the correlation could grow from $r = 0.50$ to 0.76.

techniques are promising because they allow researchers to overcome the limitations of traditional techniques when testing the domain specificity of creativity and creative self-beliefs. In the case of LCA, researchers can, for instance, test whether people's perceptions of being creative are best classified in a domain-specific versus domain-general way. Similarly, researchers can use bifactor CFA to examine different models of self-belief factors and determine whether the best fitting models are domain specific or domain general.[j] Given the potential benefits of these techniques, we encourage creativity researchers to include them in studies designed to examine the nature of creative self-beliefs.

Use Blended Methods and Data Sources

There are many individual and sociocultural factors that can influence self-beliefs. Previous work has provided useful insights into potential correlates—including everything from personality traits, motivational beliefs, and environmental supports (Beghetto, 2006; Karwowski, 2011, 2015; Tierney & Farmer, 2002) to creative activity and achievement (Silvia, Wigert, Reiter-Palmon, & Kaufman, 2012). Previous work has provided important insights that can be built on and further tested using the recommendations we propose herein.

Ideally, researchers should use methods that blend more dynamic quantitative measurement (e.g., experience sampling methods; Silvia et al., 2014) with in-depth, process-immersive qualitative studies (Glăveanu, 2015) to better understand the dynamic nature of creative self-beliefs. This includes developing programs of research that allow researchers to examine more microlevel features of creative beliefs, such as examining how particular features of the sociopsychological and material features of a performance setting dynamically influence creative-self beliefs (Beghetto, 2017). This also includes designing longitudinal studies that allow researchers to take a broader view and explore how creative beliefs develop and help shape one's CI. Such efforts are ambitious and resource intensive, but they can go a long way in clarifying the multifaceted role that self-beliefs play in influencing creative thought, behavior, and identity.

[j]Bifactor models have several advantages over the typical exploratory factor analysis or even testing and comparing the fit of several models (e.g., one factor, several factors, or models with higher-order factors) obtained in CFA. The most crucial advantage is the possibility to simultaneously test for domain generality (having one general factor in the model) and domain specificity—thanks to factors loaded by domain-specific items. This allows researchers to examine to what extent items or tasks measure general versus specific aspects of creativity. Applications of bifactor models have been quite common among intelligence researchers (see, e.g., Frisby & Beaujean, 2015), but this method is underused in creativity literature (see Barbot et al., 2016 or Jankowska & Karwowski, 2015 for exceptions).

CONCLUDING THOUGHTS

Our goal in this chapter was to untangle three key self-beliefs in the creativity studies literature. We discussed how previous work has provided important starting points for understanding these beliefs and how the findings from such work (including our own) have been limited due to lack of conceptual and methodological clarity. We thereby attempted to clarify how these beliefs are similar (e.g., representing a system of beliefs that help shape one's CI) and how they differ in their focus (i.e., perceptions of confidence, appraisal and regulatory beliefs, and perceptions of competence) and how they differ across three key dimensions (i.e., temporal, task, and stability dimensions). We closed by offering suggestions for how researchers can modify or develop new measures of these beliefs.

In reflecting on our own work, we can safely say that studying creative self-beliefs is, at times, a humbling experience, but always a fascinating one. We hope that creativity researchers find some promising new ideas and directions for their research in this chapter. We also hope that researchers will join us in our efforts to test and refine the ideas and recommendations we have presented herein. Doing so will go a long way in clarifying the somewhat mercurial and complex role that creative self-beliefs play in helping to shape creative thought, action, and identity.

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Considering Creative Self-Efficacy: Its Current State and Ideas for Future Inquiry

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Organizational innovation depends on many things, but it always starts with the creativity of individuals and small groups. Because generating creative ideas involves moving past existing mental frameworks, it can be challenging for individuals to marshal the cognitive resources and persistence necessary for success. Innovative organizations, such as IDEO, the famous design and innovation consulting firm, have found that one important key to being creatively motivated is that one must possess a sense of confidence, or, more precisely, self-efficacy, toward one's capability for creative work (Kelley & Kelley, 2013). Self-efficacy, as defined by Bandura (1997, p. 3), refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments." In this chapter we are concerned with a particular type of self-efficacy, creative self-efficacy (CSE), "the belief one has the ability to produce creative outcomes" (Tierney & Farmer, 2002, p. 1138). Since its initial formulation, CSE has been a popular construct in a variety of literatures (e.g., organizational, psychology, and education), with some form of correlational assessment in more than 40 studies using samples ranging from elementary, middle, high school, and university students to a wide variety of worker types (e.g., inventors, entrepreneurs, R&D scientists, nonprofit employees, insurance agents, operations) in markedly different cultural settings (e.g., the United States, Taiwan, Poland, Pakistan, China, Australia, Norway, Israel, and South Korea). Despite growing research interest in CSE, substantive reviews of its use and place in the organizational creativity

literature are scarce (for a very recent exception, see Puente-Diaz, 2016; see also Karwowski & Lebuda, 2016, for a meta-analysis of creative self-beliefs including CSE). The purpose of this chapter is to build on initial work in this area, first by reviewing CSE's place in nomological relations of predictors/correlates, outcomes, moderators, and mediators, followed by discussion of outstanding questions and possible future directions for the CSE research stream. Table 2.1 provides a summary of selected studies providing correlational data for CSE.

PREDICTORS AND CORRELATES OF CREATIVE SELF-EFFICACY

Given its potential to engender creativity and related phenomena, many CSE-related studies have focused on the identification of factors that might explain its emergence. The current set of CSE antecedents and correlates represent a mix of varied individual-level phenomena, as well as contextual factors.

Individual Factors

Biodata and Demographic

Early on, Tierney and Farmer (2002) proposed and found that characteristics of job tenure and educational level positively predicted CSE in both manufacturing and operations employees. Subsequent study results for job tenure have been mixed, with a positive relation found by Hsu, Hou, and Fan (2011) but no links detected in additional studies (Tierney & Farmer, 2011; Zhou, Hirst, & Shipton, 2012). Organizational tenure has often been included as a control variable in studies involving CSE, but given its broad connotations across jobs, it is not surprising that no associations have been found (Carmeli & Schaubroeck, 2007; Gong, Huang, & Farh, 2009; Huang et al., 2016; Mathisen, 2011; Shin, Kim, Lee, & Bian, 2012; Yang & Mossholder, 2010; Zhang & Zhou, 2014). Interestingly, tenure with supervisor, which should correlate with job tenure, does seem to be associated with CSE (Strickland & Towler, 2011), a result which suggests leader influence on subordinate CSE (a point elaborated subsequently). A number of studies have supported the positive relation of educational level with CSE (Strickland & Towler, 2011; Tierney & Farmer, 2004, 2011; Yang & Mossholder, 2010; Zhang & Zhou, 2014), although several have not (Hon & Chan, 2013; Malik, Butt, & Choi, 2015; Zhou et al., 2012). Tierney and Farmer (2004) also found task expertise to be related to CSE. Several studies show that males tend to report higher creative efficacy than females (Karwowski, 2011; Zhou et al., 2012), but other studies have

TABLE 2.1   Selected Studies Reporting Correlational Data for Creative Self-Efficacy

References	Use of CSE in Study				Significant CSE Correlates and Outcomes				CSE Use		
	IV	Mod V	Med V	DV	Individual Factors	Work Context Factors	Team Factors	Outcomes	Level of Analysis	Sample/ Setting	CSE Measure
Baron and Markman (2004)	✓				Need for achievement			Patents obtained	Individual	Inventors receiving patents	Tierney and Farmer (2002)
Beghetto and Baxter (2012)	✓							Intellectual risk taking Math competence Science competence	Individual	Elementary students	CSE math, CSE science, adapted from Tierney and Farmer (2002)
Beghetto (2006)	✓				Mastery orientation Performance orientation	Supportive teacher feedback			Individual	Middle school students	Adapted from Tierney and Farmer (2002)
Beghetto (2007)	✓				Mastery goals Performance-approach goals	Teacher support Academic demands		Perceived science competence	Individual	Middle school students	Adapted from Tierney and Farmer (2002)
Beghetto (2009)	✓				Interest in science	Teacher support		Intellectual risk taking	Individual	Elementary students	Adapted from Tierney and Farmer (2002)
Beghetto, Kaufman, and Baxter (2011)	✓							Teacher ratings of student creativity	Individual	Elementary students	Adapted from Tierney and Farmer (2002)

1. BROAD CONSIDERATIONS

TABLE 2.1 Selected Studies Reporting Correlational Data for Creative Self-Efficacy (*cont.*)

References	Use of CSE in Study				Significant CSE Correlates and Outcomes				CSE Use		
	IV	Mod V	Med V	DV	Individual Factors	Work Context Factors	Team Factors	Outcomes	Level of Analysis	Sample/ Setting	CSE Measure
Bui and Baruch (2011)	✓				Mastery orientation Epistemic motivation		Learning Goal setting Commitment	Administrative, teaching, and research performances	Individual	University employees in Vietnam	Tierney and Farmer (2002)
Carmeli and Schaubroeck (2007)		✓				Perceived customer, family, and leader expectations		Creative work involvement	Individual	Financial service employees in Israel	Adapted from Chen, Farh, Campbell-Bush, Wu, and Wu (2013)
Choi (2004)			✓		Intrinsic motivation Creative personality Cautious personality (negative) Creative ability	Supportive leadership	Open group climate	Creativity	Individual	University students	Developed own measure
Chong and Ma (2010)				✓	Polychronicity	Supportive leadership			Individual	Employees in Australia	Tierney and Farmer (2002)
DiLiello et al. (2011)		✓						Self-rated creativity	Individual	US Army Contracting Agency employees	Tierney and Farmer (2002)

Gibbs (2014)				✓	Gender			Individual	Black entrepreneurs	Tierney and Farmer (2002)
Gong et al. (2009)			✓		Gender Learning orientation	Transformational leadership		Creativity	Individual	Insurance agents in Taiwan	Tierney and Farmer (2002)
Gregoire and Shepherd (2012)	✓							Start-up foundings Prior knowledge of technologies and markets	Individual	Entrepreneurs	Adapted from Tierney and Farmer (2002)
Gupta and Sing (2014)	✓				Optimism Hope Resilience	R&D leadership		Self-reported creativity: Problem identification Information search Idea generation Idea promotion	Individual	R&D scientists	Tierney and Farmer (2002)
Hon and Chan (2013)			✓		Gender		Empowering leadership Team self-concordance Task interdependence	Team creativity	Group	Hospitality employees in China	Shin and Zhou (2007)

TABLE 2.1 Selected Studies Reporting Correlational Data for Creative Self-Efficacy (*cont.*)

References	Use of CSE in Study				Significant CSE Correlates and Outcomes				CSE Use		
	IV	Mod V	Med V	DV	Individual Factors	Work Context Factors	Team Factors	Outcomes	Level of Analysis	Sample/ Setting	CSE Measure
Hsu et al. (2011)	✓				Job tenure Openness to experience Conscientiousness Agreeableness Extraversion Optimism			Self-rated innovative behavior	Individual	Salon employees in Taiwan	Tierney and Farmer (2002)
Huang, Krasikova, and Liu (2016)				✓				Creative process engagement Creativity		Employees in a US IT company	Tierney and Farmer (2002)
Jaussi and Randel (2014)	✓				Expertise Internal scanning External scanning			Radical creativity	Individual	For profit and government employees	Tierney and Farmer (2002)
Jaussi et al. (2007)	✓				Creative personal identity			Creativity	Individual	Senior managers in insurance agency	Tierney and Farmer (2002)

Karwowski (2011)				✓	Creative ability Self-reported originality Socioeconomic status Gender Social ties				Individual	High school students in Poland	Developed own measure
Karwowski et al. (2013)				✓	Creative personal identity Extraversion Conscientiousness Neuroticism (negative) Openness to experience				Individual	Employees in Poland	Developed Short Scale of Creative Self (SSCS)
Karwowski (2014)				✓	Creative personal identity Fixed creative ability mindset Growth creative ability mindset				Individual	Polish workers	CSE items from SSCS
Karwowski (2015)				✓	Creative abilities		Peer effects at class and school level		Multilevel		

TABLE 2.1 Selected Studies Reporting Correlational Data for Creative Self-Efficacy (*cont.*)

References	Use of CSE in Study				Significant CSE Correlates and Outcomes				CSE Use		
	IV	Mod V	Med V	DV	Individual Factors	Work Context Factors	Team Factors	Outcomes	Level of Analysis	Sample/ Setting	CSE Measure
Karwowski (2016)	✓			✓	Creative personal identity				Individual		
Karwowski et al. (2015)				✓	Gender	Teacher creativity expectations			Individual		
Li and Wu (2011)			✓		Optimism Cognitive reappraisal Promotion orientation			Self-reported innovative behavior	Individual	University students in Taiwan	Tierney and Farmer (2002)
Malik et al. (2015)		✓			Intrinsic motivation			Creativity	Individual	Employees in Pakistan	Adapted from Schwarzer (1999)
Mathisen (2011)				✓	Supervisory position Gender Educational level	Job-required creativity Job autonomy LMX Support for creativity			Individual	Manufacturing employees in Norway	Tierney and Farmer (2002)
Reiter-Palmon, Robinson-Morral, Kaufman, and Santo (2012)	✓							Self-reported creativity (general, at work, in school, in hobby)	Individual	University students	Tierney and Farmer (2002)

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Study					Effect	Moderators/Mediators	Outcome	Level	Sample	Source
Richter et al. (2012)		✓			Positive effect		Creativity	Individual	Employees in R&D teams	Tierney and Farmer (2002)
Robbins and Kegley (2010)	✓						Fluency Flexibility Originality	Individual	University students	Tierney and Farmer (2002)
Robinson-Morral et al. (2013)		✓			Creativity requirements		Self-reported creativity	Individual	University students	Tierney and Farmer (2002)
Seo et al. (2015)	✓						Individual absorptive capacity	Individual	Employees in South Korea	Tierney and Farmer (2002)
Shin and Eom (2014)	✓					Openness to experience Risk-taking norms Task interdependence Job-level diversity Team risk-taking norms	Team proactivity Team creativity	Group	Employees in South Korea	Adapted from Tierney and Farmer (2002) and Carmeli and Schaubroeck (2007)
Shin and Zhou (2007)			✓			Transformational leadership Task interdependence	Team creativity	Group	R&D employees in South Korea	Adapted from Tierney and Farmer (2002)

(Continued)

References	Use of CSE in Study				Significant CSE Correlates and Outcomes				CSE Use		
	IV	Mod V	Med V	DV	Individual Factors	Work Context Factors	Team Factors	Outcomes	Level of Analysis	Sample/ Setting	CSE Measure
Shin et al. (2012)		✓			Openness to experience	Task interdependence		Creativity	Individual	Employees in China	Carmeli and Schaubroeck (2007)
Simmons, Payne, and Pariyothorn (2014)		✓			Means efficacy			Creativity	Individual	University students Employees	Tierney and Farmer (2002)
Strickland and Towler (2011)					Supervisor tenure Education Openness to experience	Job-required creativity Charismatic leadership		Creativity	Individual	Employees	Tierney and Farmer (2002)
Tierney and Farmer (2002)		✓			Job tenure Educational level Job self-efficacy	Job complexity		Creativity	Individual	Manufacturing and operations employees	Tierney and Farmer (2002)
Tierney and Farmer (2004)				✓	Education Task expertise	Supervisor creative expectations Supervisor creativity support		Creativity	Individual	R&D employees	Tierney and Farmer (2002)

Reference								DV	Level	Sample	
Tierney and Farmer (2011)	✓			✓	Educational level Creative role identity Job self-efficacy	Supervisor creative expectations Job complexity Job-required creativity		Creativity	Individual	Nonprofit employees	Tierney and Farmer (2002)
Zhang and Zhou (2014)			✓		Educational level Gender Uncertainty avoidance Trust Tolerance of ambiguity	Empowering leadership Job requirement for creativity		Creativity	Individual	Employees in China	Tierney and Farmer (2002)
Zhou et al. (2012)			✓		Gender Intrinsic motivation	Job problem-solving demand		Creativity	Individual	Employees in China	Tierney and Farmer (2002)

CSE, Creative self-efficacy; DV, dependent variable; LMX, Leader–Member Exchange; Med, mediator; Mod, moderator.

found no relation (Gibbs, 2014; Zhang & Zhou, 2014) or that the relation was domain-specific (Karwowski, Gralewski, & Szumski, 2015). A few additional studies (Gong et al., 2009; Mathisen, 2011) found gender to be related to CSE but did not report the coding, so no inference can be made. Overall, the findings for these biodata and demographic characteristics are mixed and suggest their effects may be contingent on the nature of the sample or other individual, job, or organizational factors.

Big 5 and Other Personal Traits

Several studies have shown that openness to experience is positively related to higher levels of CSE (Hsu et al., 2011; Karwowski, Lebuda, Wisniewska, & Gralewski, 2013; Shin et al., 2012; Strickland & Towler, 2011). Concerning the other Big 5 factors, Hsu et al. (2011) found that CSE also related to conscientiousness, agreeableness, and extraversion, whereas Karwowski et al. (2013) found a positive connection for CSE with conscientiousness and extraversion, and a negative association with neuroticism. In a meta-analysis assessing the relationship of the Big Five personality traits with creative self-beliefs, including CSE, Karwowski and Lebuda (2016) found relations between CSE and all five, with the strongest relationship with openness, and quite weak relations for CSE with agreeableness and neuroticism. The meta-analysis also showed CSE to be strongly related to plasticity (a metatrait combining openness and extraversion).

Concerning other personality traits, Chong and Ma (2010) found a positive pattern between CSE and the trait of polychronicity (preference to be engaged in two or more tasks or events simultaneously), while another study reported that individuals presenting with an overall "cautious" personality tended to have lower levels of CSE (Choi, 2004). The positive psychology traits of optimism (Gupta & Sing, 2014; Hsu et al., 2011; Li & Wu, 2011), hope, and resilience (Gupta & Sing, 2014) also demonstrate a positive link with being more efficacious about one's creative capability.

Motivational Factors

A number of motivational variables have been commonly investigated in conjunction with CSE. Studies have shown that learning, learning-related (e.g., epistemic), or mastery goals and/or orientations seem strongly related to CSE (Beghetto, 2006, 2007; Bui & Baruch, 2011; Gong et al., 2009; Li & Wu, 2011). Interestingly, there is evidence that performance or performance-approach goals, whose empirical effects are often opposed to learning, are also related to CSE (Beghetto, 2006, 2007). Intrinsic motivation has also shown a positive pattern with CSE (Choi, 2004; Malik et al., 2015; Zhou et al., 2012), but as we discuss later, we believe CSE and intrinsic motivation are distinct motivational mediators through which individual-level creativity is achieved.

Self-Efficacy and Identity

In line with self-efficacy theory's tenet that efficacy in related but broader domains may generalize to more specific domains (Bandura, 1997), a few studies (Bui & Baruch, 2011; Tierney & Farmer, 2002) have found a connection between job self-efficacy and CSE, with one study (Tierney & Farmer, 2011) detecting a pattern in which jobs self-efficacy predicted CSE during a 6-month time period. Interestingly, a study examining a more general self-efficacy across domains found no association with CSE (Baron & Markman, 2004). In terms of other self-concept constructs, studies have found that individuals who held creativity as part of their individual identity profile through either a personal creative identity (Jaussi, Randel, & Dionne, 2007; Karwowski et al., 2013) or a creative role identity (Tierney & Farmer, 2011) reported a stronger sense of confidence in their creative capacity.

Work Context Factors

Although relatively less research has linked CSE to job and contextual variables, there are a growing number of studies that have begun to explore how CSE levels may connect with the facets of the work environment the individual experiences.

Leadership

Given that leaders may significantly affect the likelihood that employee creativity will emerge in organizational contexts (Tierney, 2008), it is not surprising that a number of studies have concentrated on potential leader effects for CSE. Studies have approached this line of inquiry from a variety of different leadership perspectives. Results suggest that CSE demonstrates a positive association with supportive forms of leadership including interpersonal support (Chong & Ma, 2010), general encouragement and reinforcement (Choi, 2004), as well as support reflecting task and team facilitation and creativity recognition and initiation (Tierney & Farmer, 2004). Noncontrolling leadership has been connected with CSE (Chong & Ma, 2010), as has charismatic leadership (Strickland & Towler, 2011), and transformational leadership (Gong et al., 2009; Shin & Zhou, 2007). Given that sense of competence is an inherent component of psychological empowerment, empowering leadership has also demonstrated an impact on CSE (Gupta & Sing, 2014; Hon & Chan, 2013; Zhang & Zhou, 2014). Finally, research also indicates that employees tend to have stronger CSE when they believe that their leaders hold creative expectations for them (Tierney & Farmer, 2011).

Job Attributes

Fewer studies have explored aspects of the job or activity in which the employee is engaged in terms of CSE effects. Of these, a number of studies

have detected a positive relationship between CSE and job complexity or closely related constructs, such as job-required creativity (Tierney & Farmer, 2011; Zhang & Zhou, 2014) and problem-solving demand (Zhou et al., 2012). A caveat here is that when one examines how changes in job-required creativity impact CSE, the effect on creativity may initially be negative as individuals assimilate the new job demands (Tierney & Farmer, 2011).

Team-Related Factors

To date only three studies have focused on CSE at the team level, but two others have included team variables as predictors. Bui and Baruch (2011) found team learning, team goal setting, and team commitment to be positively associated with CSE at the individual level. Similarly, Choi (2004) found an open group climate to be directly predictive of an individual's CSE. Team-level empowering (Hon & Chan, 2013) and transformational (Shin & Zhou, 2007) leadership are related to higher levels of team CSE, as are higher levels of task or work independence (Hon & Chan, 2013; Shin & Eom, 2014; Shin & Zhou, 2007). Finally, Karwowski (2015) found that school- and class-level peer effects (school quality, creative activity, fluency) had a significant role in predicting students' CSE levels.

THE ROLE OF CREATIVE SELF-EFFICACY

An examination of the collection of studies focusing on CSE shows that the construct has been considered in a myriad of ways across investigations and as playing a variety of potential roles in the dynamics for creativity-related phenomena.

CSE as a Predictor

Because creative action can require perseverance in the face of challenges, such as initial failures, a motive force is required to propel individuals toward creative action (Amabile, 1996). Self-efficacy provides such a force, insofar as it fosters the positive outcome expectations (Ford, 1996) that lead to choice, initiation, and sustainability of engagement (Bandura, 1997). Most studies of CSE position it as a predictor of creative outcomes. As depicted in Table 2.1, the current body of research supports this expectation with a series of studies reporting creativity-related outcomes that are positively related to CSE. Several published and unpublished meta-analyses confirm the consistent and moderately strong relationship between CSE and both other-reported and self-reported creative work outcomes. An early study (Eder & Sawyer, 2007) based on four published and six unpublished studies found that the average weighted

and measurement-adjusted correlation of CSE with creativity was 0.48 (0.36 with other-reported creativity, 0.73 with self-reported creativity), higher than any other individual, social, or contextual factor considered. In a similar meta-analysis based on eight studies of creativity predictors, Hammond, Neff, Farr, Schwall, and Zhao (2011) calculated the estimated true score correlation between CSE and creativity, corrected for unreliability in the predictor and criterion to be 0.33 (0.29 for other-reported data, 0.45 for self-reported data). The relationship was stronger than that evidenced by all other creativity predictors examined including a wide variety of personal, job, and context-related factors.

In another meta-analysis comparing self versus non–self-creativity ratings with a set of variables similar to those from Hammond et al., the corrected correlation for the non–self-report studies with creativity was 0.45 (0.69 for self-reported creativity), higher than for any other predictor except job requirements (Ng & Feldman, 2012). Finally, in a meta-analysis of 73 independent samples, Liu, Jiang, Shalley, Keem, and Zhou (2016) reported a corrected correlation of 0.31 for the CSE–creativity relationship. However, their methodology combined studies using CSE with those using general self-efficacy, so circumspection is required in considering their results. An important consideration, however, in the aforementioned studies is that similar to other self-view variables, the relation of CSE with creativity is likely to be inflated by implicit theory bias if self-reported creativity data are used (indeed, self-reported creativity may be considered a creative self-belief that may or may not be related to objectively assessed creativity; Karwowski & Lebuda, 2017). It is also important to note that the meta-analyses were conducted on a relatively small numbers of studies. The aforementioned findings, considered together, provide compelling evidence that CSE is positively related to creativity in the workplace, and that the power of CSE is such that it plays out as a stronger correlate of creativity than a wide variety of other predictors. Such an effect is reinforced by results from Tierney and Farmer (2011), who found that changes in CSE during a 6-month time period tracked with corresponding changes in creative performance.

CSE as a Moderator

Several studies have focused on how the positive effect of CSE may depend on or be enhanced by other creativity-relevant factors. These studies have tended to focus on two key areas. One area is the extent to which expectations to be creative, whether self-generated or job-related, provide a motive force to be creative that augments the positive creative outcome expectancy induced by higher CSE. In two organizations, Carmeli and Schaubroeck (2007) found an augmenting interaction such that creativity was highest when both self-expectations for creativity and CSE were

high. This effect seems to hold even if creativity expectations are organizationally generated, with results from Robinson-Morral, Reiter-Palmon, and Kaufman (2013) showing quality and originality of problem-solving solutions to be highest when problem solvers had high creative efficacy and also perceived high requirements for work creativity. The second area of focus concerns use of group resources. Shin et al. (2012) reported a cross-level interaction such that team cognitive diversity, a group-level informational resource, translated only into individual creativity when CSE was high. Similarly, Richter, Hirst, Van Knippenberg, and Baer (2012) found that functional background diversity (i.e., diversity in professional background, reflecting differences in "knowledge, information, expertise, and perspective," p. 1285) and collective awareness of the information and expertise team members possess interacted to augment the effects of CSE on individual creativity. In these two studies, individuals with higher CSE realized more creative benefits from team informational resources. Other work considering CSE as a moderator includes Malik et al. (2015) finding the extrinsic rewards (creativity relationship was positive when CSE was high, but negative when CSE was low), Tierney and Farmer (2002) showing an interaction of CSE and job self-efficacy for creative performance, and DiLiello, Houghton, and Dawley (2011) showing CSE interacting, individually, with both work group support and supervisor support to affect self-perceived creativity.

CSE as a Mediator

As noted earlier, empirical evidence indicates that CSE plays a key role in the initiation and sustaining of creative action. Furthermore, the aforementioned review suggests that a number of individual, contextual, or team-related variables are associated with CSE (see Liu et al., 2016, for meta-analytic evidence supporting CSE as a mediator). Additional studies have tested whether CSE may therefore be a key mediating mechanism explaining the effects of various creativity antecedents on creativity-related outcomes. Li and Wu (2011) found CSE to be a partial mediator between optimism and innovative behavior. From a motivational perspective, Gong et al. (2009) reported that CSE fully mediated the effects of learning orientation on creativity. In terms of job context, creative efficacy building may be an important way that job-based opportunities to engage in creative work are enacted, with Zhou et al. (2012) finding that CSE mediated the effects of a job's problem-solving demand on creativity when intrinsic motivation was high.

Several studies have supported the idea that CSE development is an important intervening process that can help explain the leadership–creativity link. Gong et al. (2009) found CSE to fully mediate the effects of transformational leadership on creativity. Similarly, Shin and Zhou (2007)

reported that CSE mediated the effects of an interaction between transformational leadership and educational specialization heterogeneity on team creativity. CSE has also been shown to mediate the effects of supervisor creativity support behaviors (Tierney & Farmer, 2004), supportive leadership (Choi, 2004), and empowering leadership (as it interacted with uncertainty avoidance and trust; Zhang & Zhou, 2014) on employee creativity. In the sole group-level study involving creative efficacy as a mediating mechanism, the relationship between empowering leadership and team CSE was stronger when group members worked interdependently, and CSE mediated this interactive effect on team creativity (Hon & Chan, 2013). Overall, these leadership studies and the other mediator studies described here provide a solid base of empirical evidence for CSE as an important avenue through which other factors can build creativity.

Measurement of CSE

As shown in Table 2.1, the construct of CSE has been tapped by a number of different self-reported scales (e.g., Carmeli & Schaubroeck, 2007; Karwowski, 2014; Malik et al., 2015), with most studies empirically tapping CSE using or adapting the original Tierney and Farmer's (2002) three-item scale. Across samples in the studies cited in Table 2.1, this measure or its variants have a median Cronbach alpha of 0.83, suggesting an adequate degree of reliability for this short scale. Additionally, in studies where construct validity has been assessed (usually by a series of confirmatory factor analyses), this measure shows discriminant and convergent validity relative to other nomologically related constructs, such as job self-efficacy (Tierney & Farmer, 2002), creative role identity (Tierney & Farmer, 2011), and intrinsic motivation (Zhou et al., 2012). As noted earlier, a number of studies have successfully used adapted versions of the Tierney and Farmer measure in settings other than the US culture within which it was originally developed. Such settings include Vietnam (Bui & Baruch, 2011), Australia (Chong & Ma, 2010), Norway (Mathisen, 2011), South Korea (Seo, Chae, & Lee, 2015; Shin & Eom, 2014; Shin & Zhou, 2007), as well as a variety of Chinese/Taiwanese settings (e.g., Gong et al., 2009; Hon & Chan, 2013; Hon & Lu, 2014; Hsu et al., 2011; Li & Wu, 2011).

EMERGENT RESEARCH QUESTIONS AND LINES OF FUTURE STUDY

Considering our comprehensive review of the extant literature addressing CSE, a series of research questions emerge that lay the foundation for future inquiry. The first concerns the relationship of CSE with other individual attributes. Early work on creativity (e.g., Barron & Harrington, 1981)

focused on the attribute or personality profile of creators. A fairly consistent pattern of connection with creativity-related outcomes suggests that CSE may have a legitimate place in such a profile. However, there is still much we do not know about how CSE is positioned within a composite of other creativity-germane personal attributes. For example, is there a hierarchical structure present such that CSE engenders attributes that are further conducive to creative forms of engagement and processes, or is CSE more subordinate in the hierarchy of such individual-level factors? While a number of identity types an individual may hold, such as personal, relational, collective, and role are likely to relate to creativity (Tierney, 2015), initial assessment by Tierney and Farmer (2011) found that creative role identity (Farmer, Tierney, & Kung-McIntyre, 2003) preceded one's creative sense of efficacy. Subsequently, Karwowski (2016) showed a reciprocal relationship between the two in an adolescent sample, and Karwowski and Barbot (2016) reanalyzed the Tierney and Farmer (2011) data, finding essentially equal reciprocal relations across the 6-month time period. Finally, another interesting line for examination is how various types of personal attributes interact with CSE in ways that may either enhance or detract from creative performance.

One of the most commonly discussed individual attributes associated with creativity is that of intrinsic motivation. CSE and intrinsic motivation are commonly positioned as primary motivational paths to creativity (Shin, 2015). Even though the two constructs likely occupy related space within a motivational framework for creativity, it is important to discern the extent to which they are unique and impact creativity in unique ways. For example, CSE is a self-regulatory state subject to considerable fluctuation, whereas intrinsic motivation is considered to be relatively more stable. Furthermore, the two constructs seem to operate through different mechanisms (Choi, 2004). CSE may operate in part by affecting outcome expectancies, whereas self-determination may be relatively more important for intrinsic motivation (Malik et al., 2015). Given these differences, while it is likely that both may be useful in helping us understand what draws employees to creative engagement, it is likely that they may play complementary but different roles in this regard. Studies designed to identify the unique, and possibly joint or interactive, means by which both CSE and intrinsic motivation shape creativity would be useful in moving a motivational view of creativity forward (see the meta-analysis by Liu et al., 2016, for recent evidence showing CSE and intrinsic motivation to have unique mediating effects on creativity).

Moving forward, we should also ask what important questions have not yet been considered in terms of contextual antecedents of CSE. Although employees spend the majority of their workday engaged in their job activities, and job attributes are considered a prime determinant of self-efficacy formulation (Gist & Mitchell, 1992), we currently have limited knowledge of how specific job attributes may come into play for CSE views. Given

the immediate and consistent exposure to job attributes for employees, we need to expand our investigation to a broader set of job-related factors that may hold potential for shaping CSE levels. For example, operating in a job characterized by high levels of job interdependence could either enhance or hurt CSE depending on the creativity opportunities such interdependence afforded employees. The degree of feedback inherent in the job activities could also be a factor, with jobs that provide more immediate and direct performance feedback having the strongest effect on CSE levels. Surprisingly, although autonomy is one of the most commonly cited job attributes for creative performance, to date, there are no studies directly exploring its impact on CSE. We might expect to see CSE enhanced as employees have the discretion and flexibility to explore and experiment in their activities, and move toward greater confidence in their ability to bring creativity to their work. Thought should also be given to the intricate relationship between job attributes and the way CSE evolves. For example, although previous research suggests that job complexity is beneficial for creativity, a recent study (Tierney & Farmer, 2011) found that employees working under increased levels of job complexity reported decreased CSE. The authors noted that the employees participating in their study may have been still adjusting to the increment in job complexity and were not yet at the stage where they had mastered the additional complexity, and could use it as a foundation for enhanced CSE views.

Given that CSE formulation is largely dependent on social cues (Karwowski, 2015; Karwowski et al., 2015; Tierney & Farmer, 2011), additional work utilizing a social framework perspective would permit us to understand more about CSE's emergence and influence. An interesting issue to explore is the extent to which CSE is amenable to social influence and possible factors that might determine the capacity for CSE to be shaped by external factors. Considering multiple social influence sources to which employees are exposed within the confines of their jobs, which might we expect to have the most influence on an employee's creative capacity beliefs? As noted earlier, a small and promising set of studies has considered CSE within a team context (e.g., Bui & Baruch, 2011; Hon & Chan, 2013; Shin & Zhou, 2007) but further work is needed. For example, is it reasonable to assume that more proximal and peer-level influences to which the employee is exposed on a consistent basis, such as team members, would carry more weight for CSE levels than more distal influences, such as top management? Furthermore, in formulating their CSE, how do employees manage multiple, but conflicting social cues regarding their capacity for creative work? What individual-level attributes might come into play in determining which social influences impact CSE, and the extent to which such influences shape such efficacy self-views? How would CSE work in terms of embeddedness? For example, in terms of creative performance, is it better to be a low-CSE person in a high-CSE team, or a high-CSE person in a low-CSE team?

While the vast majority of studies focusing on the influence of CSE have considered it in terms of creative performance or engagement, it is worthwhile to consider other outcomes that might arise as a result of the construct. One interesting issue to explore is whether CSE itself represents a form of social influence on others. For example, does the CSE level of those with which an employee interacts impact the CSE of the employee? In other words, is there a possible contagion effect whereby working with someone who has a strong, or weak, CSE leads to enhanced, or depressed, CSE levels of others? A study has shown that leaders' CSE may shape employee creativity (Huang et al., 2016), but would it likely also affect their CSE as well? Studies linking CSE with positive aspects, such as hope, optimism, and resilience (Gupta & Sing, 2014) present an interesting pattern that might beg the question if CSE might be linked to positive states or attitudes, such as job satisfaction.

Now that we have accumulated a body of studies identifying a reasonable set of CSE antecedents, it would be useful to consider such factors more closely with an eye toward identifying how they explicitly operate via Bandura's efficacy-building mechanisms of vicarious experience, verbal persuasion, affective/physiological states, and enactive mastery. Such an approach would provide a more theoretically consistent lens for understanding how CSE and its antecedents operate within the self-regulatory framework. As noted earlier, leadership has been positioned as influential for CSE. If we were to examine the relationship within Bandura's framework, we may detect patterns such that the Leader–Member Exchange (LMX) leadership mode enhances CSE via enactive mastery, verbal persuasion, and affective states due to the operational freedom and resources, positive challenge and encouragement, as well as the trust and interpersonal support high-LMX employees are afforded. It may also be the case that transformational leaders serve as role models for creativity, therefore enhancing CSE via the vicarious experience mechanism. Furthermore, empowering leaders could likely shape CSE via forms of verbal persuasion, as well as the eliciting of positive affective states. Although more negative forms of leadership have not yet been examined in terms of their effects on CSE, it would be likely that modes, such as abusive supervision may be detrimental to CSE via aversive emotional and physiological (i.e., stress) experiences.

Beyond the notion of CSE as a multipotent motivational mechanism, we might consider the construct in additional ways that are relevant for creativity. While CSE clearly has cognitive underpinnings, are there ways in which CSE serves as an affective influence for creativity by engendering certain emotions or mood states? Prior work finding relations between CSE and positive psychological variables such as optimism, hope, resilience (Gupta & Sing, 2014), as well as links with emotional regulation (Li & Wu, 2011) suggests that exploring CSE from an affect-based perspective could hold much potential. Perhaps CSE's influence is also

more cognitively based leading to a heightened awareness or focus in certain ways conducive to creative engagement. A recent study's (Jaussi & Randel, 2014) findings lend support here, finding that CSE operates in part for radical creativity by increasing external scanning. Employee beliefs may also come into play as demonstrated by a recent study's (Karwowski, 2014) finding that individuals who held a "creative mindset," whereby they believed creativity was malleable as opposed to fixed, tended to have stronger CSE. It would also be useful to examine whether CSE is linked to certain types of attributions made regarding creative successes and the extent to which such attributions are self-reinforcing.

Another possible way for CSE to influence creativity through a cognitive route is in fostering a future time perspective. Future time perspective may lead to more insights and higher creativity, as shown by a series of six studies reported by Förster, Friedman, and Liberman (2004). Self-efficacy appears to be a key factor that can induce a future-oriented time perspective (Epel, Bandura, & Zimbardo, 1999), insofar as motivation is determined by cognitive representations of future states, such as distal goals. A possible direction for empirical research is, therefore, to assess whether higher levels of CSE may lead to a future time perspective, and the extent to which this impacts idea originality by promoting more general and abstract object representations.

An additional important venue for future research is the examination of CSE at a multilevel and cross-level basis. A number of studies applying CSE at the team level (Shin & Zhou, 2007) suggest a multilevel homology for the CSE and creativity relationship, although at the team level group processes, dynamics, and structures are in play. For example, Richter et al. (2012) report that team informational context affects the translation of individual team member CSE into creativity. Advancing the application of CSE from a level perspective might warrant investigation into the possibility that an organizational-level CSE construct is tenable, and influential for the body of creative work among employees and work teams, and the possible connection with organizational innovation.

Indeed, the body of work exploring CSE in the workplace seems to suggest that it represents a viable resource at the organization's disposal for engendering enhanced creative activity and performance among the workforce. Along these lines, a number of fruitful avenues of HR-related research would be warranted. One of the most useful aspects of CSE is that it is malleable and therefore should be amenable to targeted training and other forms of intervention (Tierney & Farmer, 2011). Despite such promise, there are only a handful of studies that have adopted intervention designs in studying CSE (e.g., see Mathisen & Bronnick, 2009; Robbins & Kegley, 2010). Additional studies that provide direction for practicing managers in their attempts to design and implement CSE enhancement programs would be useful in moving the needle on creative engagement of employees.

CONCLUSION

The existing body of research suggests that CSE may actually play a multitude of roles in relation to other critical constructs for creativity. Furthermore, the field of research has begun to branch out to explore more avenues by which CSE may manifest and the impact that its presence might have. The goal of the current chapter was to provide an overview of the literature to date and provide an organizing framework for considering the ways in which CSE has been investigated to date. Building off of our review, we attempted to provide research questions that might guide future and needed inquiry into the self-concept. In a relatively short period of time, CSE has shown promise as a key construct in the repertoire of creativity-related factors that might shed light on the complexities surrounding creative engagement and performance. As the body of research on this construct moves forward, we believe that the CSE construct may prove quite useful for enhancing both the theoretical understanding and the practice of creativity in a multitude of settings.

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Creativity and Identity

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It is not uncommon for those in the visual, literary, or musical arts to view their work as having self-expressive qualities or as inherently linked to their identities. The classic expression of this might be Samuel Johnson who claimed "I write therefore I am." As noted in Erikson's book on creativity, artist Leo Gavel commented, "every created thing appears with fingerprints somewhere in the finished project like a personal signature" and "even a portrait of someone else is also a portrait of the artist" (Erikson, 1988, pp. 137–139). Some writers go so far as to suggest that the creative act promotes the discovery or creation of the self. For example, the Mary Poppins creator, Travers (1997) commented that in the process of making something, the creator is "reciprocally defined, shaped and ordered … the potter, molding the receptive clay, is himself being molded" (p. 42). In this same vein, about her medieval detective character, Brother Cadfael, novelist Ellis Peters reportedly said, "I say that I created him but he's been busy creating me." In short, a number of artists have expressed sentiments linking their creative actions with their identities. Analyst Storr (1993) viewed creativity as a quest for identity. In particular, Storr described the artist as someone who, despite a strong ego, is motivated toward creative endeavors by the need to discover his/her own sense of identity. Storr (p. 308) quoted from a lecture by composer Aaron Copeland who felt that "I must create in order to know myself … (that) each new work is only a part-answer to the question 'Who am I?'"

The goal of this chapter is to attempt to sketch in broad strokes some of the ways in which psychologists and social scientists have examined creativity and identity and to review empirical studies that are grounded in theoretical frameworks studying identity per se. We also consider creativity studies focusing on the less theoretically specific, but still relevant, *creative identity*. We should note that we come from a Personality and Life-Span Developmental Psychology perspective; hence, we focus

in particular on studies conceptually related to the identity-theoretical traditions of Erikson's developmental stages and the work on personal identity/internal environment versus social identity/external environment identity by Sampson (1978) and Cheek (1989). We will not consider the issue of multiple or dual identity but refer readers to several examples (Cheng, Sanchez-Burks, & Lee, 2008; Gocłowska & Crisp, 2014). We very briefly consider work stemming from the Experimental Social Psychological framework of the Tajfel and Turner (1979) social identity theory typically using experimental manipulations of identity salience.

Historically, the link between creativity and identity was considered by scholars from a variety of disciplines, most commonly using qualitative approaches, referring to a person's creative inclinations or products as inherently important to their sense of who they are as persons. Several researchers have discussed creative identity in professionals or in children (Cawelti, Rappaport, & Wood, 1992; Rostan, 1998), occasionally from a psychoanalytic framework compatible with their qualitative approach (Kavaler-Adler, 2000; Miliora, 2001). The possibility of such linkages has been explored not surprisingly in a number of qualitative dissertations (e.g., Gillett, 2013; McCaleb, 2013; Shay, 2013; Walker, 1999; Weller, 2014) but also in marketing research (Sethi, Smith, & Park, 2001). Although such writings focus on experiences of being creative, they are not usually grounded in theoretical approaches to identity. Our purpose in this chapter is to appraise the hypothesis suggested by such comments: how are creativity and identity empirically related?

DEFINING CREATIVITY AND IDENTITY

Unlike identity, most researchers tend to agree in general terms on what they mean by creativity, usually referring to the two-part definition as reviewed by Mayer (1999; cf. Cropley, 1999): the creation of products that are judged to be both novel (or original) and valued (useful, functional). Aside from this broad definition, creativity is operationalized in many different ways ranging from divergent thinking (e.g., unusual uses for a brick, uncommon word associations) to products rated by appropriate judges, to questionnaires measuring creative potential or creative personality/efficacy/identity, to checklists of creative accomplishments or supervisor ratings of employees' creativity, and to lifetime creativity documented from eminent status, records in archives, or historical sources.

From the most general standpoint offered by dictionaries of Psychology (e.g., Reber, 1995; VandenBos, 2007), identity is viewed as the physical and psychological characteristics not wholly shared with others or making a person (or group) distinctly different from others, and involving a sense of continuity. It is occasionally referred to as *self-identity* or *personal*

identity (VandenBos, 2007). However, the term *identity* is often qualified by modifiers, such as sex-role identity, social identity, cultural identity, gender identity, and racial or ethnic identity (Reber, 1995). Whereas developmental psychologists view identity as evolving (being created or discovered), experimental social psychologists view identity as easily manipulated in the short term by information that makes some aspects more salient. However, most researchers view it as having at least moderate temporal stability. In general, a key to identity is the question "Who am I?" (or "Who are You?"), and early classic studies used this question as a methodology (Bugental & Zelen, 1950; Gordon, 1968; Kuhn & McPartland, 1954); later studies used it with the title Twenty Statements Test or Spontaneous Self-Concept (McCrae & Costa, 1988; McGuire & McGuire, 1982). Ziller (2000) also started with this question in his autophotographic essay method. Using this open-ended method, researchers typically measure identity categorically by having participants list those qualities that are salient to themselves. The method can generate responses falling into many discrete psychological and physical categories that can easily be interpreted within James's (1961) concept of the material, social, and spiritual selves, but can also be grouped to form broader social or other identities. Most recent research has operationally defined identity in terms of theoretically based interviews or questionnaires (as noted in the subsequent text) or with more ad hoc measures designed by researchers for their particular purposes.

THEORETICAL BACKGROUND ON PERSONAL IDENTITY

The seminal theorist of identity development was Erikson (1963, 1980). Although Erikson did not discuss creativity at length, his own period of moratorium—during which he worked as an artist—prefigured a key element in his future theory of identity. Erikson is best known for his concept of the eight stages and psychosocial crises of humankind, ranging from the issue of trust acquisition in infancy to the achievement of psychological integrity in life's final years. Although his writings were somewhat vague on creativity, it would seem to be most relevant in issues of identity (the fourth stage) and generativity (the seventh stage). Identity researchers themselves rarely study creativity, although they have debated whether identity itself is discovered or created (Berzonsky, 1986; Waterman, 1984). So creativity researchers have tended to ignore Erikson's concept of identity, drawing conceptual capital from the works of Freud and Jung but rarely from the work of Erikson. A literature review of personality theories bearing on creativity is a good example of this trend (Woodman, 1981), probably reflecting an emphasis on the unconscious (cf. Smith & van der

Meer, 1994). One important exception should be noted. Addressing factors that may lead gifted youth toward creative careers and eminence, Albert (1990) explicitly drew on Erikson's views: "being creative involves several aims—to be in control of one's own identity, to see that identity more clearly, to free it from everyday limits … (and that) … creative behavior … is a demonstration of the legitimacy of one's identity and talent" (p. 26).

A central component in Erikson's theory is the issue of identity versus identity (or role) confusion. This issue takes center stage in the so-called moratorium period. At this point in development, adolescents may experiment with different beliefs and social roles, discovering which best fit the self, in particular exploring questions, such as "who am I?," "what do I believe?," and "what shall I do with my life?" Identity crisis (or identity exploration; Marcia, 1994) refers to this period of moratorium during which the adolescent is uncertain about and exploring his or her identity. Identity commitment refers to the resolution of such issues. Marcia (1966) translated Erikson's ideas into the combination of identity crisis and commitment in a two-by-two factorial, resulting in four identity statuses: achieved identity (having explored who one might become, and then making commitments), moratorium (uncommitted but still exploring), foreclosure (making a commitment without much exploration usually by following the expectations of family and friends), and identity diffusion (uncommitted and not exploring identity). This conceptualization provided a heuristic framework for much of the empirical work on Erikson's theory. A fairly extensive literature exists on the concepts of Identity Statuses (Marcia, 1966) and Identity Styles (Berzonsky, 1989, 1994). Whereas earlier work focused on the four status groups, more recent work has used Berzonsky's process-oriented concepts of Identity Styles: the Information seeking, Normative, and Diffuse identity styles. Information seeking represents an openness to exploring information relevant to one's personal choices, whereas the normative style is a process similar to foreclosure—feeling satisfied with parental and peer group influences. The diffuse style, like the diffusion category, involves avoidance of decisions.

In *The Life Cycle Completed* (Erikson, 1982, p. 67), Erikson associated creativity in part with his seventh stage, that is, the issue of generativity. However, he also discussed creativity in his unpublished writings (Hoare, 2002, Chapter 6), noting the diminishing spontaneity and playful quality that many adults lose from their childhood—and that allows children to explore "new identity elements." In Erikson's view, the creative person thinks visually, is capable of trusting the senses, has a spirit of curiosity and wonder, and is comfortable with solitude. Erikson also "equated living in the inner and sensory world and in the world of nature, freed from human artifacts, with joy, beauty, grandeur, awe, imagination, a freed psyche, learning and creativity" (Hoare, 2002, p. 139). Erikson's spouse and collaborator, Joan Erikson (1988, p. 133) further extended the

developmental theory to creativity. In her view, being creative entails positively resolving all of the psychosocial crises. She noted that a major hurdle for the artist is to create from what is uniquely one's own; to do otherwise is to not be genuine.

Whereas all eight stages are potentially relevant to creativity, we agree with Albert (1990) that identity issues are particularly important to creativity: that is, the steps that adolescents and young adults make toward finding an occupational identity often will be grounded in their special interests and unique accomplishments. By recognizing their skills in, say, work with the hands (e.g., art, crafts, mechanics), adolescents implicitly are engaging in a potential future occupational identity that might be developed and pursued further. In contrast, individuals who derive special pleasure from dealing with words or numbers (e.g., in literary skills, math, and science) may be more likely to explore their identities in these directions. These explorations could take the form of seeking further instruction in particular endeavors leading in turn to greater skill and creativity in those areas. In contrast, adolescents who take the identity paths suggested or assumed by family and friends (i.e., the more foreclosed) may be less inclined toward creative pursuits. Finally, those who are disinterested in exploring possibilities for the self should also have few creative accomplishments—they might have creative potential but for various reasons do little to develop that potential. Thus, operationalizations of identity exploration and identity information seeking should be relevant to creativity, particularly among adolescents and young adults, and perhaps to older adults as well.

A second potentially useful theoretical framework is that of Inner/Outer or Personal/Social Identities as described by Sampson (1978) and elaborated by Cheek (1989). Although Erikson theorized about the "inner world" (Hoare, 2002), this approach is conceptually grounded in such theorists as Jung and Maslow concerning authenticity and the "inner self," and James's (1961) distinction between the spiritual and social (and material) selves. According to this view, people differ in the extent to which they orient toward personal versus social aspects when they consider who they are. [This inner–outer metaphor underlies many of the differences between personality and social psychology, and runs throughout the social sciences. It is interesting, too, that psychologists and sociologists studying identity may differ in their relative amount of focus on the personal or environmental aspects of identity (AIQ; Côté & Levine, 2002)]. For some individuals, the inner world of personal identity is most self-defining (e.g., defined by one's dreams or imagination). For others, their reputation and the impressions they make on others are central. Sampson (1978) suggested that people "differ in their general environmental orientation—their awareness of or sensitivity to events or conditions—some being more oriented to the external and others to the internal environment"

(p. 554). Sampson used Gordon's (1968) classification of "Who Are You" responses by analyzing internality–externality ratings of such characteristics as emotions, thoughts, and feelings (on the one hand) versus popularity, memberships, and physical features (examples on the other end). Cheek, Tropp, Chen, and Underwood (1994) extended this with a series of studies validating the personal, social, and collective identity aspects. Thus, they have shown the relevance of personal identity to the experience of private self-consciousness (Cheek & Briggs, 1982), proneness to guilt (private/internal) (Lutwak, Ferrari, & Cheek, 1998), independence of judgment (Cheek, 1989), and the seeking of jobs that allow for creativity and self-fulfillment (Leary, Wheeler, & Jenkins, 1986). Those scoring high on the social identity scale show higher levels of public self-consciousness, self-monitoring (to make their behavior socially appropriate), proneness to shame, and foreclosed identity. Such individuals also choose jobs that afford opportunities for good relationships and prestige. Thus, the concept of Personal Identity (i.e., a preference for identifying inner rather than outer aspects as most self-defining) should be of special relevance to creativity.

EMPIRICAL EVIDENCE

Until recently, few studies addressed the identity–creativity question. First, studying high school and college samples, Waterman and colleagues found that poetry writing—but not journal writing—was significantly related to identity achievement (Waterman & Archer, 1979; Waterman, Kohutis, & Pulone, 1977). Moreover, in longitudinal research, the dimension of "cultural sophistication" (including artistic interests) predicted later identity achievement (Waterman & Goldman, 1976; Waterman & Waterman, 1971). Also conducting a longitudinal study, Helson and Pals (2000) studied graduates of a liberal arts college for women when participants were in their early 20s and again in their early 40s. These authors correlated California Q-sort personality descriptions with a prototype of the identity-achieved person (Mallory, 1989); each participant's similarity to this prototype was the measure of identity achievement. Helson, Roberts, and Agronick (1995) then used this measure to predict occupational creativity at age 52, based on the creativity implied by career choices and accomplishments. Controlling for age 21 creative potential, identity achievement at age 43 indeed predicted creativity. However, an age 21 identity achievement measure and an age 27 "identity consolidation" measure did not predict age 52 creativity. Helson and Pals concluded that creative achievement is associated with both intrapsychic and psychosocial personality development. The impressive Helson and Pals (2000) study focused longitudinally on real-world creativity with follow-up well

into the participants' adult lives. However, the different results for the two measures of identity achievement raise questions, as does the lack of reported correlation between them. It would also be interesting to know whether any participants were in moratorium status in their early 20s and whether they became creative in the process as a result of their identity explorations. Nevertheless, the study does indicate the value of this research question.

As noted earlier, more recent scholars of identity have placed a greater focus on identity process rather than identity status (Adams & Marshall, 1996; Berzonsky & Adams, 1999). According to Berzonsky (1989, 1992, 1994), identity development can be conceptualized in terms of three social-cognitive styles of decision making, particularly decisions about the self. Self-explorers use an *information orientation*; before making identity-relevant decisions, they actively seek out and process information. These individuals are expected to internalize new possibilities for themselves and thus to enhance their creativity. The earlier status group of foreclosure is reflected in a *normative orientation*, consisting of a concern with the standards and prescriptions held by family and friends. Finally, uncommitted or diffuse individuals operate with a *diffuse orientation* involving avoidance and procrastination. Thus, the latter style translates to letting circumstances dictate one's life paths. The latter two orientations should yield less creativity than the more active informational style. Berzonsky uncoupled the commitment and exploration components by including an identity commitment scale to his styles inventory, since commitment and exploration were confounded in past objective measures of identity status. Research on Berzonsky's Identity Styles Scale indicates that the dimensions have theoretically meaningful relations to identity status groupings, coping styles, need for cognition, and openness to experience (Berzonsky, 1989, 1992, 1994; Berzonsky & Sullivan, 1992).

Dollinger and Dollinger (1997) found indirect support for the identity–creativity connection by examining the association of college students' identity statuses and styles with the richness of autophotographic essays (Ziller, 2000), a creative product developed to the question "who are you?" Specifically, university students' photo-essays were rated by judges on a dimension of richness or individuality (i.e., more creative, aesthetically oriented, complex, self-reflective, multidimensional, "one-of-a-kind" vs. repetitive, conventional, dull, and unimaginative). In categorical analyses, students in the achieved and moratorium statuses were judged to have richer photo-essays than those in the foreclosed and diffuse statuses. In a conceptual replication study, participants scoring highest on Berzonsky's informational style had the richest photo-essays, followed by the diffuse and then the normative-preferring participants. In other words, the richness of self-descriptive photo-essays related to both identity status and identity style. Thus, individuals who engage in greater identity exploration

depict themselves with greater individuality or richness in photo-essays, [for other relevant work, see Barbot (2008) and Barbot and Heuser (this volume)].

The photo-essay procedure was also used in connection with Sampson's concept of the "location" of identity and Cheek's (1989) AIQ measure. Using multiple regression, Dollinger, Preston, O'Brien, and DiLalla (1996) found that the individuality of photo-essays was predicted by the three AIQ scales in simultaneous regression, with significant negative betas for Social and Collective Identity, and a significant positive one for Personal Identity. In short, those who depicted the greatest richness and individuality felt that internal or Personal aspects were most self-defining, whereas those devising stereotypic and less creative self-portraits focused on their external (Social and Collective) identity aspects as important.

Given that photo-essay instructions prompt thoughts about who one is, the photo-essay in fact falls at the intersection of identity and creativity—because individuality/richness is measured with the consensual assessment technique. Thus, it represents a kind of creativity applied to the self. In this regard, in cross-sectional analyses, it is noteworthy that the individuality/richness of photo-essays seems to increase with age, as indeed does the inclusion of creative products as a category within photo-essays (Dollinger & Dollinger, 2003).

Using a variety of different creativity measures, Dollinger, Clancy Dollinger, and Centeno (2005) built on the previous studies by considering both Berzonsky's Identity Styles and Cheek's AIQ. Creativity was operationalized by judge-rated creative products (stories and drawings), self-reported creative accomplishments from the Creative Behavior Inventory (Hocevar, 1979), ratings of an open-ended creativity dossier, and, finally, a measure of creative potential, the empirically derived Creative Personality Scale (Gough, 1979). We hypothesized that the informational orientation and personal identity scales would predict creative potential, past creative accomplishments, and present creative products over and above variance explained by gender and verbal intelligence; we also expected that the normative and diffuse-avoidant styles, as well as social and collective identity scales would relate negatively to creativity. Note that, unlike Helson and Pals (2000), our prediction was that information seeking rather than the *achievement* of an identity would be critical for adolescent and young adult creativity. We did not expect identity commitment to predict creativity because, for this age group, a high level of commitment making might be viewed as "premature closure" and thus something that creative students would avoid. The five creativity measures were standardized and averaged for use as a creativity composite. In a hierarchical multiple regression, the first step (gender and vocabulary) accounted for 11% of the creativity variance, primarily attributable to verbal ability. The second step consisted of either Identity Style Inventory (ISI) or AIQ

Questionnaire scales. For the ISI analysis, an additional 10% of variance was accounted for, primarily due to information seeking and normative styles. Again, information seeking led to greater creativity, whereas the normative style led to lower overall creativity. For the AIQ analysis, all three measures contributed to explaining an additional 13% of the creativity variance. As in Dollinger et al. (1996), Personal Identity contributed positively to creativity, whereas Social and Collective Identities contributed negatively. Thus, it seems clear that individuals who define themselves in terms of their social identities and group memberships score lower in creativity, whereas their counterparts with a stronger Personal Identity orientation draw on their less visible inner qualities as inspiration for their creative contributions.

Subsequent work with the autophotographic essay has produced a number of insights into the individualistic personality, particularly in terms of their inquiring intellect and verbal abilities, general and political values, reading interests, and other kinds of creativity and linguistic processes in their written essay. This research is summarized in Dollinger (2017) so we will note only one finding here. Dollinger (2006) conducted a follow-up survey of students who devised photo-essays 5–9 years earlier. The follow-up survey asked about creative activities and accomplishments, as well as awards and honors received. Five judges with varying creative backgrounds rated the typed responses. As an example, one low-rated response stated: "I have not had enough free time to pursue creative endeavors. My life since 1995 has been spent in pursuit of degrees, jobs, and licensure as a Clinical Professional Counselor." One high-rated response was: "I have taken oil painting classes and hand coloring black and white photos. I start an acrylic painting class this week." Because Openness is consistently the best personality predictor of creativity (Feist, 1998), a regression model predicted postcollege creativity from individuality/richness ratings and this trait, *both measured on average 7 years earlier*. Whereas Openness did not make a significant contribution, individuality indeed predicted later creativity.

CONTEMPORARY RESEARCH ON CREATIVE IDENTITIES

In recent years a new line of identity research has emerged primarily within Personnel and I/O Psychology. Growing out of sociological construct of role identity (e.g., Burke, 1991; Callero, 1985; Petkus, 1996), Farmer, Tierney, and Kung-Mcintyre (2003) adapted a scale to measure creative role identity. This concept and scale identifies individuals for whom creativity at work is important (e.g., "To be a creative employee is an important part of my identity"). The Farmer et al. study of engineers

and software developers in Taiwan showed, among other findings, that higher levels of creative role identity correlated with higher supervisor-rated creativity. Wang and Cheng (2010) conducted a similar study (also engineers in Taiwan), finding creative role identity to be a useful moderator between benevolent leadership and creativity. Tierney and Farmer (2011; see also Farmer and Tierney, this volume) used the measure again in a large longitudinal study of child and family services employees across a range of professional levels. For our purposes, it should be noted that creative role identity was quite stable during the 6-month interval ($r = 0.63$) and changes in creative role identity predicted change in creative self-efficacy (although not supervisor-rated creativity).

The creative role identity measure was modified slightly to become a more general and stable Creative Personal Identity concept (i.e., nonwork situations) by Jaussi, Randel, and Dionne (2007). They studied insurance managers with some seniority (Vice President level, all older than 40 years of age). Interestingly, their analyses showed that supervisor-rated creativity was predicted by identity when both self-efficacy and openness were controlled. Karwowski, Lebuda, Wisniewska, and Gralewski (2013; see also chapter in this volume) incorporated the Creative Personal Identity and Self Efficacy scales into their Short Scale of Creative Self for an online survey of more than 2500 Polish research panel members (participants). They found that creative personal identity and self-efficacy are empirically distinct, although, when correlated with the Big Five, both have their strongest correlate in Openness to Experience with secondary correlates depending somewhat on gender.

Different perspectives on our findings can be offered by social identity theory (Haslam, Adarves-Yorno, Postmes, & Jans, 2013) and by a sociocultural theory of creative identity (Glăveanu & Tanggaard, 2014). From the social identity theory perspective, Haslam and coworkers have proposed a framework for the study of factors that contribute to the shaping of creative acts, as well as the reception that such acts are given. In a series of interesting studies, they have shown that when social identity is salient, creative behavior *and evaluations* are likely to be informed by group values, preferences, and norms. Thus, there can be times when thinking that diverges from the norm is not judged to be creative. Space does not permit a complete review (for more examples of this approach, interested readers are referred to other sources, e.g., Adarves-Yorno, Postmes, & Haslam, 2007; Hirst, van Dick, & van Knippenberg, 2009). However, this perspective does place some qualifications on findings we noted earlier—specifically the negative correlations of creative outcomes with the ISI normative identity style, and the AIQ social and collective identity scales. That is, the social identity theory approach may be taken to suggest that our findings are partly attributable to the salience of personal identity. As such, it calls to our attention those features that might make it so—the fact

that participants were recruited from Psychology and usually Personality Psychology courses at a large relatively nonselective university, the fact that autophotographic instructions emphasize "who are you as you see yourself," and the limited audience of an instructor and small research team viewing photo-essays. Perhaps different findings would be obtained if participants were recruited from (say) courses in sociology or from colleges where particular identities are very salient (e.g., religiosity, high test scores, primarily one ethnicity), or if a large team of undergraduate peers were used as the audience/raters thus enhancing social comparison concerns. So, the work of Glăveanu and Tanggaard (2014) also challenges our person-centric findings by focusing attention on the ways in which identity is momentary, multiple, and fluid over time, and how it is embedded in dialogue with social environments.

FUTURE DIRECTIONS

We offer three directions for future study on creativity and identity. First, it will be interesting to link up the earlier identity concepts/measures grounded in Erikson's theory with the newer Creative Personal Identity and Creative Self-Efficacy measures. Given similar associations with Big Five Openness, it is likely that both will be positively related to the Information-Seeking Style (ISI) and Personal Identity (AIQ) but negatively with Normative and Diffuse Styles, Social and Collective Identities. Because our participants, by and large, were adolescents, a more interesting issue would be whether Social and Collective Identities have different associations with creativity in work settings with more mature participants, and with participants from less individualistic cultures. In particular, it would be interesting to determine whether Social and Collective Identities are positively related to creative group projects. If so, it would imply that the present findings are limited because none of the creative outcome measures depended on group work. Following the thinking of Haslam et al. (2013), it would be interesting to study cultures or collective groups where individuals have invested in particular identities to examine these issues further. For example, as Glăveanu and Tanggaard (2014) noted, "craftsmanship is defined mostly by its anonymity (as the) continuity of tradition takes center stage" (p. 17). Perhaps those involved in folk art would show a different pattern of association on creativity measures. [As noted by Dollinger et al., 2005, identity measures were less highly correlated with crafts than with visual and literary arts of the Creative Behavior Inventory.)

Second, it would be desirable for research to continue moving from description—or demonstration that associations exist—toward a process orientation to establish mediators, moderators, and limiting conditions.

Several recent studies have begun to do so. We need further study of what the constructs are really tapping. In this regard, useful demonstrations are beginning to show that identity concepts (creative identity, normative identity) predict creativity even when other factors are equal (creative self-efficacy or Openness to Experience; see Dollinger et al., 2005; Jaussi et al., 2007).

Third, exciting work in neuroscience is addressing possible underlying mechanisms that contribute to identity development across the life span. This area of research includes an examination of brain structures (particularly the cerebellum; Saggar et al., 2015), neural correlates of creativity (Greenfield, 2016; Vartanian, Bristol, & Kaufman, 2013), and identity (Greenfield, 2016). Relations between dementia and creativity (Greenfield, 2016), as well as the dynamic interaction between sociocultural and underlying biological mechanisms (e.g., Mrazek, Harada, & Chiao, 2015), are just a couple of examples of exciting contemporary research areas. Studies in these areas should be particularly informative when measures of creativity and identity are explored within the same participants.

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Creativity and Free Will: Creative Thought Enhances Personal Freedom?

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What does it mean for the self to exert "free will?" What does it mean for a person to generate a "creative thought?" My goal in this chapter is to argue that the answers to these two questions are intimately related. In essence, bona fide creativity represents a pure act of free choice. A necessary repercussion of this argument is that creative individuals are, in a certain, very real sense, more free than noncreative persons. To be sure, the connection between creativity and personal freedom has been suggested by others as well. Perhaps most notably, Maslow's (1970) theory of self-actualization included creativity and autonomy among the attributes of self-actualizers (see also May, 1975; Rogers, 1954). Even so, I will propose that creative thought and free will share a common psychological structure that renders their interrelation not just empirical but also logical (Simonton, 2013b). To create is necessarily to be free.

I believe that this essential connection is frequently overlooked because it integrates two phenomena that are most often relegated to distinct academic domains. On the one hand, free will is far more likely to be treated by philosophers, as seen in handbooks on the subject in which philosophers wrote most, if not all, of the chapters (e.g., Kane, 2011b). On the other hand, creativity is primarily a subject addressed by psychologists, as witnessed in handbooks of creativity in which psychologists wrote most, if not all, of the chapters (e.g., Kaufman & Sternberg, 2010). Furthermore, just as philosophers rarely if ever discuss creativity in their treatments of free will, so do psychologists largely avoid discussing free will in their research on creativity.

Naturally, every so often researchers will cross over between the two disciplinary topics. On the philosophical side, an edited volume on the philosophy of creativity, though containing numerous chapters by philosophers, featured no specific treatment of the relation between free will and creativity (Paul & Kaufman, 2014; see also Krausz, Dutton, & Bardsley, 2009). On the psychological side, an edited volume on free will (Baer, Kaufman, & Baumeister, 2008) not only contained chapters mostly by psychologists but also contained one chapter on creativity (Simonton, 2008). Yet the latter contribution made very little, if any, real contact with psychological and philosophical ideas about free will.

Recently, I attempted to establish that free will and creativity may often share a deep underlying cognitive makeup (Simonton, 2013b; cf. Doyle, 2011). This common mental structure is so profound that acts of free will and creativity can become identical and simultaneous events. In this chapter I will review, update, and extend this integrative framework.

TWO PARALLEL STAGES

I start by presenting a two-stage theory of creativity. That presentation will then provide the needed formal concepts for treating a two-stage theory of free will. Given those two developments, I can then discuss creative thought as acts of free will.

Creativity: Variation, and Then Selection

Campbell (1960) argued that all creativity depends on the two-stage process or procedure of blind variation and selective retention or what is now often termed "BVSR" (Cziko, 1998; Simonton, 2011b; or BV + SR in Nickles, 2003). Importantly, Campbell maintained that BVSR applied to "other knowledge processes" (p. 390) and not just to creativity. Thus, BVSR is also mandatory for the acquisition of all new behavioral adaptations and cognitive understandings (Nickles, 2003). For example, Skinnerian (operant) conditioning can also be interpreted as a BVSR procedure (Simonton, 1999; see also Dennett, 1995). Unfortunately, Campbell failed to give rigorous definitions of blindness or creativity, an oversight that led to unnecessary controversy concerning the connection between blind variation and creative thought (Simonton, 2011c). Only recently was his conceptual failure corrected by a set of formal definitions (Simonton, 2013c; cf. Simonton, 2012c). A simplified representation of those definitions is given in the subsequent text, the simplifications imposed to underline those features that transfer most immediately to free will (e.g., simultaneous rather than sequential selection; Simonton, 2013a). First, I define creativity, and then I define sightedness, the inverse of blindness.

Creativity Defined

Although creativity can assume many guises, including exploration and discovery, I focus the discussion now on creative problem solving (Simonton, 2012b; cf. Simonton, 2016b); that is, an individual tries to come up with an effective solution to a previously acknowledged problem. One advantage of this conception is that many circumstances in which volitional behavior occurs are also inherently problem solving in nature, such as choosing the best course of action from a set of two or more alternative choices. Very frequently personal choices are solutions to life's challenges (Baumeister, 2008). Let us now imagine an episode in which an individual attempts to solve an important problem. The person then conceives k potential solutions, where $k \geq 1$. Each of these k potential solutions can be denoted by $x_1, x_2, x_3, \ldots, x_i, \ldots, x_k$ and the complete set of solutions by X (cf. Simonton, 2011a). For example, in Maier's (1931, 1940) well-known two-string problem, participants were instructed to tie together the ends of two cords suspended from the ceiling. The participants generated up to seven potential solutions using various means provided by the experimenter, so that $k = 7$, of which four solutions actually attained the required goal. In brief, participants had up to four effective solutions from which to select their response. The solution with the highest probability—simply grabbing the end of one cord and then tying it to the end of the other—was among the three potential solutions that could not get the task done:

1. The *initial probability* that the person will come up with solution x_i is represented by p_i, where $0 \leq p_i \leq 1$. Furthermore, $\Sigma p_i \leq 1$, which allows the possibility that all potential solutions could have probabilities so low that the probabilities will not sum to unity. The latter situation emerges when all alternative solutions possess very weak "response strengths" (e.g., "maybe *this* or maybe *that* but maybe *none* of them" as in exploratory BVSR; Simonton, 2013a). Finally, if $p_i = 0$, then the solution x_i is not immediately evoked, but can presumably be elicited after an incubation period that is terminated by a suitable priming stimulus (Hélie & Ron, 2010; Seifert, Meyer, Davidson, Patalano, & Yaniv, 1995). If this contingent termination is impossible, then k must be reduced to that subset of solutions that can be potentially generated within a reasonable time. The trivial case occurs when $k = 0$ because then the individuals cannot conceive a single potential solution no matter how long the problem is pondered. The individuals then arrive at a lasting dead end. Many of us have faced problems during the course of our lives that were forever unsolvable!

2. The *final utility*, u_i, is the probability that solution x_i will actually prove useful, valuable, or appropriate (and hence be selected and retained according to the second half of BVSR). Here $0 \leq u_i \leq 1$ (where 0 = completely useless; 1 = maximally useful) and $0 \leq \Sigma u_i \leq k$

(i.e., from none of the potential solutions work to all of them work perfectly). A solution's utility can be described as a continuous variable, yet in many situations, it becomes a dichotomous 0–1 characteristic. For example, in Maier's (1931, 1940) two-string problem, a solution either lets the person to tie the two strings together or fails to do so. Halfway solutions do not exist. Frequently, set X will hold one solution that works while all the others fail. The solution is then unique (so that $\Sigma u_i = 1$ no matter what the size of k). For instance, when Watson (1968) used cardboard models to tinker around with alternative DNA base codes, there were four possible pairings ($k = 4$), only one of which would actually work (and perfectly so), the remaining three having absolutely no utility whatsoever.

3. The parameter v_i gauges the person's *prior knowledge* of the utility (where $0 \leq v_i \leq 1$ and $0 \leq \Sigma v_i \leq k$). Whenever $v_i = 0$, the individual is ignorant of whether or not the solution will work without first executing a test, but when $v_i = 1$ the person knows the value of u_i in advance, and perfectly so, independently of the utility's actual value. In the latter case, a generation-and-test, trial-and-error, or variation-and-selection procedure is pointless. Hence, in algorithmic problem solving $v_i = 1$, whereas in heuristic problem solving $v_i \ll 1$ (cf. Amabile, 1996; Simonton, 2011b). If v_i lies somewhere between 0 and 1, the utility status of the solution is often a mere "hunch" based on tacit knowledge yet to reach full consciousness (the precise value representing differing "feeling of knowing" states; cf. Bowers, Regehr, Balthazard, & Parker, 1990). In this middle range, to learn that the solution proves useful or not can still elicit some degree of surprise. To be complete, we must also allow the situation where all of the utilities might be perfectly known, whether useful or useless, in which situation $\Sigma v_i = k$. When this holds, BVSR becomes superfluous. BVSR is needed only for separating high-utility from low-utility solutions when the utilities are initially unknown or imperfectly known. Of course, any solution with the values $v_i = 1$ and $u_i = 0$ will not even be found in set X, for then any rational intellect would set $p_i = 0$, and thus x_i will not even be subject to BVSR (cf. "preselection" in Simonton, 2011b, and "rational suppression" in Simonton, 2016a). Indeed, if $p_i = 1$ even though $u_i = 0$ and $v_i = 1$, then we have a situation comparable to the saying "insanity is doing something over and over again and expecting the same result."

Taking the aforementioned three parameters, the creativity of solution x_i in set X is now defined as follows (Simonton, 2012a, 2013b; cf. Simonton, 2012c, 2016b):

$$c_i = (1 - p_i)u_i(1 - v_i) \tag{4.1}$$

where $0 \leq c_i \leq 1$. The factor $(1 - p_i)$ denotes the solution's *originality* (i.e., highly original solutions possess low initial probabilities) and the factor $(1 - v_i)$ denotes the solution's *surprisingness*, or nonobviousness (i.e., the magnitude of ignorance prior to generating and testing the solution to gauge its utility). The middle factor u_i in Eq. (4.1) is again the solution's eventual usefulness or utility. In words, the creativity of a given solution is the joint product of its originality, utility, and surprisingness. Eq. (4.1) might appear exotic; it actually offers a direct and precise translation of standard three-criterion definitions of creativity, including that imposed by the US Patent Office to approve applications for protection (Simonton, 2012c; see also Amabile, 1996; Boden, 2004). Given that the value of c_i ranges from 0 to 1, it can be viewed as the probability that the individual will consider x_i to be creative.

I must emphasize that all three parameters are subjective or personal rather than objective or consensual (cf. Simonton, 2013c, 2016a). The focus is on a person trying to solve a problem to his or her satisfaction without the imposition of having others agree with the solution (cf. Kaufman & Beghetto, 2009). Campbell's (1960) original version of BVSR treated "thought trials" occurring within a given mind (Simonton, 2011b). Accordingly, the creator compares with Dennett's (1995) "Popperian creature" who evaluates conjectures against internal representations of the external world, an internalization of selection that "permits our hypotheses to die in our stead" (p. 375). Note that the same subjectivity also operates in free will: Free will also marks a personal rather than consensual episode, the person alone judging two or more possible courses of action (one of which might even be inaction, as in Shakespeare's *Hamlet*). Here both philosophers and psychologists agree no matter what their specific take on the nature of free will (Baer et al., 2008; Kane, 2011a). Even when an omniscient being is assumed to enjoy prior knowledge of what choice the person will make, the fact remains that the choice was subjectively experienced as personal assessments of the utilities of various available options (Hasker, 2011a). Needless to say, some components of the utility function may include moral criteria.

Sightedness Defined

Having defined creativity, the next task is to define sightedness, a construct that gauges the degree to which an idea is highly probable because (1) the idea is highly useful and (2) its high utility is already known. The most current versions of Campbell's (1960) BVSR have focused the formal representations on "sightedness" rather than "blindness" (Simonton, 2012 a, 2012b, 2013a, 2013b). Even if sightedness is merely the inverse of blindness, the former term has the asset that it avoids all of the misleading connotations that have accrued to the original concept (cf. Kronfeldner, 2010; Sternberg, 1998). Thus, instead of showing that creativity is positively

associated with blindness, the goal becomes to show that creativity is negatively correlated with sightedness. For this demonstration, it is useful to define sightedness at two levels, namely, the sightedness of a given potential solution x_i and the sightedness of the entire set of potential solutions X.

Beginning with the first task, the sightedness of a potential solution x_i is given by

$$s_i = p_i u_i v_i \tag{4.2}$$

where $0 \le s_i \le 1$. On the one hand, a solution is highly sighted ($s_i \approx 1$) if it is highly probable, highly useful, and highly probable precisely *because* it is highly useful, that is, the high utility is perfectly known when the solution came at once to mind (cf. Sober, 1992). On the other hand, a solution is highly unsighted ($s_i \approx 0$) if it has a low probability, a low utility, a low prior knowledge value, or any combination of those three low values. For instance, if a solution has a high probability but a low utility or a low probability but a high utility, then it cannot possibly be highly sighted. Most importantly, whenever the prior knowledge parameter nears zero, sightedness must approach zero no matter what the values of the other two parameters may be. This point is critical because it helps us avoid chance agreements between p_i and u_i that would make mere "lucky guesses" sighted (Simonton, 2013b). For instance, if a coin were biased toward heads and a gambler happened to have a bias in calling heads, any earnings still must be attributed to pure chance rather than to expertise if the gambler had no knowledge of the coin's bias, whether conscious or unconscious. So, even if $p_i u_i > 0$, whenever $v_i = 0$, it still holds that $s_i = 0$.

We can now define the sightedness of the entire solution set X by using Eq. (4.2) to gauge the sightedness of all k potential solutions (Simonton, 2012a, 2013b). Set sightedness is then defined by

$$S = \frac{1}{k} \sum p_i u_i v_i \tag{4.3}$$

where $0 \le S \le 1$. In words, S is the arithmetic mean of the k s_i values (i.e., the average of the joint products of the initial probabilities, final utilities, and prior knowledge values for all potential solutions). Clearly, $S = 0$ whenever $v_i = 0$ for all i (cf. the "total ignorance" condition in Simonton, 2013a).

Converting the two measures of sightedness into corresponding measures of blindness is simple: The blindness of potential solution x_i is $b_i = 1 - s_i$ while the blindness of the entire set X of potential solutions is $B = 1 - S$. Blindness and sightedness thus define opposite poles on a blind-sighted continuum (Simonton, 2011a, 2013b), thus contradicting those who want to treat blindness as a qualitative variable but sightedness as a quantitative variable (Kronfeldner, 2010).

It must be made explicit that blindness does not require any randomness. Although pre-Campbellian versions of BVSR frequently posited that ideas were produced solely by chance (Bain, 1855/1977; James, 1880; Mach, 1896; Poincaré, 1921; cf. Martindale, 2009), Campbell (1960) made it quite explicit that blind variations very often emerge from nonrandom, even deterministic processes. He offered the specific example of a radar sweep, a BVSR search strategy that is clearly systematic and not at all random. Other unequivocal instances are the search grids used in astronomy, archeology, paleontology, and other exploratory disciplines. Here Cartesian coordinates just substitute for the polar coordinates of radar scans (Simonton, 2011b).

Speaking more generally, anytime permutations of a set of ideas are generated and tested in a methodical manner, the process remains blind to the extent that the probabilities continue to be "decoupled" from the utilities because the latter are unknown or incompletely known at the outset (Simonton, 2011b; Toulmin, 1972). Frequently in BVSR episodes, the permutations are equiprobable, without any guidance from the underlying utilities because prior knowledge is absent or almost so. The person knows that the solution must be found among alternatives x_1, x_2, or x_3 but nothing else (cf. eliminatory selection in Simonton, 2013a). Even so, equiprobability is not required either (Campbell, 1960). For instance, computer programs that engage in heuristic searches through a problem space invariably generate and test potential solutions in a way that is markedly blind (Simonton, 2011b). BACON's rediscovery of Kepler's Third Law offers a typical illustration (Langley, Simon, Bradshaw, & Zythow, 1987). This discovery program generated and tested alternative polynomial functions, advancing from the simplest to the most complex (albeit omitting any redundant tests by means of the programmed heuristics; Simonton, 2011b). In general, evaluating potential solutions in order of complexity is automatically decoupled from solution utility because the individual cannot anticipate either the specific form of that complexity or the optimal level of that complexity. In the latter case, Occam's razor (the law of parsimony) only tells the person not to proceed beyond that optimum—which can only be identified after engaging in BVSR processes or procedures that go beyond that optimum. The latter necessity often forces backtracking, a telltale sign of BVSR (Damian & Simonton, 2011; Simonton, 2007, 2015a, 2015b). Once one can go only downhill no matter what direction is selected, a peak must have been pinpointed. To offer an analogy, if one performs a stepwise regression analysis, the algorithm will eventually reach a point where the addition of more variables reduces rather than increases the adjusted R^2, the increment in variance explained no longer compensating for the loss in degrees of freedom.

The central take-home message is the following: All random variants are blind, but not all blind variants are random. Randomness is just a

subset of blindness. Insofar as creativity represents an act of free will, the same stipulation should apply—with remarkable consequences for our comprehension of free will.

Free Will: Chance, and Then Choice

The enigma of free will has perplexed philosophers for millennia. So it should surprise nobody that philosophers have conceived free will in an incredible diversity of ways (Kane, 2011a). This diversity is partly driven by the difficulties that arise in specifying how this mental event fits with either determinism or indeterminism, neither of which seems very conducive to free will (James, 1884). Even psychologists can view free will in multiple ways. For instance, Baumeister (2008) noted that free will can adopt at least two versions, rational choice and self-regulation (or "free won't"). Of these two versions, the BVSR theory of creativity is closer to rational choice because the "selection–retention" stage normally entails conscious evaluation of potential solutions using utility criteria that require a cost–benefit calculation. Nevertheless, more has to be said about where these choices come from if the aim is to analyze creative thought as free will. This requirement takes us naturally to the explicit two-stage theory of free will.

The latter has been succinctly expressed as "first chance, then choice" (Doyle, 2010, p. 1). Choices are "randomly" generated, but the selection of one particular choice would be influenced by the person's constitution at the very moment that the selection is made (which can depend on either stable traits or transient moods). Therefore, the "two-stage model effectively separates chance (the indeterministic free element) from choice (an arguably determinate decision that follows causally from one's character, values, and especially feelings and desires at the moment of decision)" (Doyle, 2010, p. 8). Both determinism and indeterminism are thereby integrated as isolated phases in a single two-stage process. Observe that it is not really the will that is free but rather the choices that are free: The individual merely wills one choice out of those accessible at decision time. The term "free will" is misleading insofar as the adjective modifies the wrong noun. Once the choice is made, the will is psychologically determined.

Many philosophers and scientists might be credited with the two-stage theory in some form, albeit some might have only discussed the theory without necessarily advocating it (Doyle, 2010). One way or another, names associated with the theory include the philosophers Daniel Dennett, John Martin Fischer, Robert Kane, Alfred Mele, and Karl Popper, mathematician and physicist Henri Poincaré, physicist and philosopher Henry Margenau, physicist Arthur Holly Compton, biologist A.O. Gomes, psychologist Stephen Kosslyn, and neurogeneticist Martin Heisenberg, the son of the physicist Werner Heisenberg, the discoverer of quantum

indeterminancy (Doyle, 2010, 2011). Of those in this list, Popper, Dennett, and Poincaré are equally noteworthy for also discussing implicit versions of BVSR theory (Dennett, 1995; Poincaré, 1921; Popper, 1963), whether regarding epistemology in general or creativity in particular (cf. Doyle, 2011). For example, Dennett (1978) compared the two-stage model of free will to the unambiguously BVSR description of the creative process previously proposed by the French poet, Paul Valéry: "It takes two to invent anything. The one makes up combinations; the other one chooses, recognizes what is important to him in the mass of things which the former has imparted to him" (Hadamard, 1945, p. 30). Valéry's rendition has the asset that it does not oblige that the combinations be generated by chance, but only that the first stage operate independently of the second stage. Chance represents only one method to guarantee independence between the combination generator and the combination selector. This independence or decoupling is the most crucial feature. Otherwise the "chooser" or "selector" becomes nothing more than a "rubber stamper" so that no authentic choice or selection is truly made (cf. Kronfeldner, 2010).

To make the last point more explicit, Eqs. (4.2) and (4.3) can be used to recast what must occur in the first stage. Instead of potential solutions, we now have the set X consisting of the k choices $x_1, x_2, x_3, \ldots, x_i, \ldots, x_k$. The sightedness of any particular choice is then defined by Eq. (4.2) and the sightedness of the whole set is defined by Eq. (4.3). The parameters are conceived approximately as before, with only minor adjustments: p_i remains the initial probability (or response strength) of the choice and v_i is still the prior knowledge of the choice's utility (or probability of selection and application), but the final utility u_i can now represent something more elusive and perhaps more ephemeral, namely, the degree to which choice x_i conforms to the individual's "character, values, … feelings and desires at the moment of decision" (Doyle, 2010, p. 8). If a given choice is conceived in utter ignorance of this utility value, then $s_i = 0$, and the choice is accordingly unsighted without necessarily being random. Likewise, if the complete set of choices is generated without prior knowledge of the actual utilities, then $S = 0$, and again the choices are all "blind" even if none of the volitional options was produced by chance.

What does it mean for choices to be generated blindly but not randomly? What was said regarding BVSR creativity applies just as well to two-stage free will: So long as the options are first produced without foreknowledge of their subjective utilities, the choices must be unsighted. Any systematic search through a set of alternative possibilities thus counts as blind but nonrandom. The outcome is a volitional analog of the radar sweep or search grid. Simonton (2013b) provided a detailed illustration involving two high school seniors deciding their college major. One person might have no idea whatsoever, and hence just goes through the list of available majors from A to Z, checking the course requirements and career

options, until she finally discovers a major that she never anticipated but that maximally fits her abilities and interests.[a] If there are 100 majors, then $k = 100$, and if all majors were initially equiprobable or nearly so, then $p_i = 1/k$. Not only will the sightedness of her final choice approach zero, but also the sightedness of the whole set then becomes very low, so that $S \approx 0$. In contrast, a second person might already know in advance what he wants to major in and consequently only looks at the college catalog to confirm that that major is available. In that case, $k = 1$ and sightedness $S = 1$. Hence, for the second student no choice was made because the major had already been predetermined. His decision is analogous to routine or reproductive problem solving (Simonton, 2013c, 2016b).

So once more, the key to two-stage free will is not whether the choices are randomly produced, but rather whether the choices are produced without prior knowledge of their utilities—the probabilities that they will in fact be chosen after rational evaluation. The sightedness values S and s_i gauge the extent of the person's predecision ignorance concerning, respectively, the set X of choices and any particular choice x_i. Thus, the inverse value B can be considered a direct quantitative measure of the extent to which the set of choices is indeed free of prior subjective determination. The same inference holds for b_i with respect to a specific choice. As blindness approaches unity, a specific choice or the set of choices becomes less predictable and hence permits more personal freedom.

Creativity and Free Will

To connect creative thought directly with acts of free will involves two additional elaborations. First, I must treat the main conditions that boost individual creativity, conditions that should also boost personal free will. Second, something must be said about the very origins of creative thoughts, especially if they are to be viewed as undisputable acts of free will.

Creativity, Blindness, and Freedom

In identifying an appropriate academic major, a student aims at utility, not creativity. In contrast, a creative person wants to find the most original, useful, and surprising solution to a given problem. In fact, occasionally an

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[a]I am assuming that the person is not a satisficer but rather an optimizer. For example, an optimizer may want to find the highest paying starting job with the fewest and easiest math requirements, thus obliging an examination of all available major options. Yet she might be a satisficer instead, immediately picking the first encountered major associated with a passable income and a manageable set of requirements. She will then have fewer choices as well as choices that are less optimal. But the decision to satisfice or optimize is itself a free choice!

act of creativity can deliberately sacrifice utility for originality or surprisingness (Simonton, 2012c). Potential trade-offs are suggested by Eq. (4.1) where, so long as $c_i < 1$, the factors $(1 - p_i)$, u_i, and $(1 - v_i)$ may assume a range of values and still arrive at an identical threefold joint product. In the two-string problem, the pliers as pendulum solution can be taken to illustrate how a little utility might be forfeited for the sake of attaining higher creativity (Maier, 1940). After all, the pendulum solution was more inconvenient than the other three solutions—via the chair, pole, and extension cord—because it alone mandated that the string be shortened first, whereas the other solutions could use the string just as it was hanging from the ceiling.

Now if a creator's main purpose is to produce creative solutions to problems, then it becomes essential to discover the circumstances that enhance creativity. A good start concerns the connection between sightedness and creativity. If Eq. (4.1) is compared with Eqs. (4.2) and (4.3), it would seem that sightedness and creativity should be negatively associated. More precisely, although u_i has the same positive role in all three equations (i.e., both sighted and creative solutions must be useful), the probability p_i is inversely related to originality $(1 - p_i)$ and the prior knowledge value v_i is inversely related to surprisingness $(1 - v_i)$. Nonetheless, the exact relation is much more subtle (Simonton, 2013b).

On the one hand, as the sightedness of a given solution x_i increases, its creativity must tend to decrease (i.e., as $s_i \to 1$, $c_i \to 0$ for any i). Similarly, as the sightedness of set X increases, the creativity of the solutions contained in that set will tend to decrease (i.e., as $S \to 1$, $c_i \to 0$ for all i). Whatever the utility value, highly probable and highly obvious solutions cannot be creative. These must constitute routine or reproductive solutions (Simonton, 2016b).

On the other hand, the analysis becomes far more interesting when the comparison is reversed by asking what takes place when blindness is increased (Simonton, 2012a, 2013b, 2016b). As a rule, as $b_i \to 1$, the expected value (M_c) of c_i will increase, the variance of $c_i (\sigma_c^2)$ will increase, the maximum possible creativity (or c-max) will increase, and the distribution of c_i will become highly skewed, most solutions becoming very low in creativity. The net consequence is a distinctive triangular distribution demonstrating that blindness is a necessary but not sufficient condition for creativity. Fig. 4.1 illustrates this point by presenting a scatter plot generated by a Monte Carlo simulation of the sightedness–creativity association (Simonton, 2012a). The distribution makes it obvious why BVSR is necessary for creative thought. Although the most creative solutions are found in the blind end of the distribution, these solutions are obscured by many more far less creative solutions. Thus, the rare grains of wheat must be winnowed from the plentiful chaff. Making the selection process all the more laborious but crucial, the larger the grains, the more voluminous the chaff is.
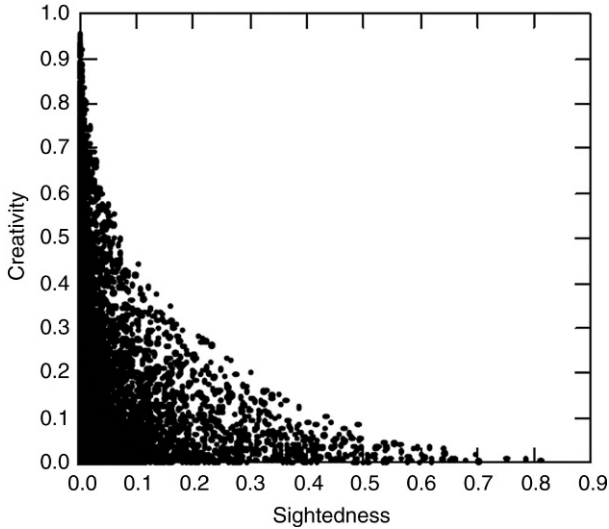
FIGURE 4.1   Monte Carlo simulated scatter plot showing the relation between sightedness and creativity for prospective solutions, where creativity is defined according to Eq. (4.1) and sightedness according to Eq. (4.2) and where p_i, u_i, and v_i have a uniform distribution. *Source: Fig. 4.1 in Simonton (2013b).*

It should also have become evident by now why creative thoughts can be considered genuine acts of free will as defined in the previous section. Creative thoughts satisfy the stipulation that they be generated without prior knowledge of whether they will actually be selected. Because solution production is at least partially independent ("decoupled") from solution selection, the ultimate choice is not a foregone conclusion. Moreover, the more creative the idea, the greater is the degree of freedom because sightedness must be minimized to obtain a higher level of creativity. This repercussion is crucial because it necessarily implies that free will itself must be a quantitative rather than a qualitative phenomenon. It is not a matter of whether or not a person has free will but the magnitude of freedom manifested in the set of choices provided in the first stage of the two-stage theory.

Once we recognize the quantitative nature of free will, the next question regards the factors that increase or decrease the degree of free will displayed in a particular rational choice episode. Obviously, given what has already been said, these factors will be those that increase B for the set X of choices and b_i for the specific choice x_i in that set. Because these factors have already been identified in recent versions of the BVSR theory of creativity, it is easy to specify the pertinent factors (Simonton, 2005, 2013b). The two most crucial are given in the following (both operating mutatis mutandis).

First, free will tends to increase with increases in k, that is, the more choices (or "alternative possibilities") contained in X, the less sighted any particular choice in that set tends to be. The student who chooses from 100 possible majors has more freedom than the student who "selects" from only 1.

Second, as the initial probabilities become increasingly equiprobable (e.g., as $p_i \to 1/k$ for all i), free will also tends to be enhanced (i.e., the alternative possibilities become maximally comparable). The student who sees many majors as having a similar "cost–benefit ratio" (e.g., demanding course work vs. later career opportunities) will have more freedom of choice than the student who views just one major as overwhelmingly superior to the others—so much so that alternative majors are not even given the most perfunctory consideration.[b]

In short, the larger the number of choices considered and/or the more equivalent the considered choices, the more free will manifested in the set X of those choices and in any given choice x_i within that set. These conclusions follow directly from the earlier formal representation of the two-stage theory of free will.

Thoughts and Choices as Combinatorial

Proponents of personal free will might complain that the concrete examples so far given to illustrate free will are far too limited. Deciding a college major entails selecting from a predetermined inventory of options. It parallels the situation in which a suspect accused of a crime has to choose between (1) accepting a plea bargain for manslaughter and (2) hoping for acquittal in a jury trial on the charge of first-degree murder. The person would rather have had more choices in set X! The uppermost degree of personal freedom must include the capacity to spontaneously produce additional options. Even if some options are already imposed by extrinsic conditions, and thus lie beyond the individual's intrinsic control, superior alternatives might be generated that allow flight from an otherwise hopeless situation. The student might enroll in an institution that allows the creation of an independent major or the crime suspect might devise an ingenious scheme to break out of prison, escape the country, and seek political asylum abroad. In brief, individuals must possess the

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[b]To be sure, the predetermined choice at the time of selecting a college major may merely represent a consequence of a free choice made earlier, perhaps many years earlier. Even so, such is the way of life. Each choice we make during the course of our existence often serves to constrain the choices we make later in life. When asked in childhood what we want to be when we grow up, the options may be very broad indeed. Yet the moment when we opt, say, for actor over athlete, the range of possibilities becomes restricted so that by the time a major is chosen, the choices might be reduced to just one. In general, many of our early choices are designed to restrict our later choices until we are finally left with no choice.

ability to *create* their choices—choices that are not only useful but also original and surprising.

To provide the basis for choice creation, it now becomes necessary to widen our original conception of creativity. Up to now, creative thought has been viewed as a guise of problem solving. Nevertheless, given that not all creativity involves problem solving, we must identify a more inclusive conception that will subordinate creative solutions to a special case. Such an identification has already taken place: Many creativity researchers have proposed that all kinds of creativity can be seen as combinatorial products (e.g., Mednick, 1962; Poincaré, 1921; Simonton, 1988, 2005, 2010; Thagard, 2012). For example, the actual solutions to Maier's (1931, 1940) two-string problem all entailed some combination of one string with another object in the laboratory—a chair, extension cord, pole, or pliers— plus the incorporation of some operations, such as holding, tying, pulling, or swinging. Some combinations were useful and others far less so. For instance, participants who considered using the pliers as tongs to pull one string over to the other quickly realized that this combination was still too short to solve the problem. Conceiving creative thoughts as combinatorial products has two main advantages.

First, viewing creativity as combinatorial allows the phenomenon to be analyzed via both computational and mathematical models (e.g., Simonton, 2010; Thagard & Stewart, 2011). These models have attained impressive success in explaining and predicting creativity's central characteristics (see, e.g., Simonton, 1997). Accordingly, the spontaneous creation of choices can also be viewed as combinatorial (see also Dennett, 1978). This combinatorial process represents the first stage of what has been christened "Valerian free will," after the Valéry quote given earlier in this chapter (Doyle, 2011). Just as significantly, these combinatorial models frequently rely on pseudorandom number generators to simulate creative phenomena, implying that creative processes *act as if* they are influenced by chance whatever might be the deterministic underpinnings (Simonton, 2003, 2010, 2012a).[c] The same seemingly random influence may apply to the first stage of free will despite the underlying determinism.

Second, abstract combinatorial models are directly connected with concrete empirical research on the cognitive processes, personal traits, developmental experiences, and environmental circumstances supporting creative

[c]It may be noted, however paradoxically, that pseudorandom number generators produce random numbers using deterministic algorithms that are designed to create numerical sequences that pass all tests for randomness—thus breaking down the distinction between determinism and indeterminism! Indeed, one of my favorite t-shirts features the saying "The generation of random numbers is too important to leave to chance," which apparently paraphrases the title of an article published by the mathematician Robert Coveyou in 1970.

thought (Simonton, 2003, 2005, 2010; Simonton & Damian, 2013). These supporting variables include divergent thinking and remote or rare associations (Gough, 1976; Guilford, 1967; Mednick, 1962; Rothenberg, 2015), reduced latent inhibition, defocused attention, or cognitive disinhibition (Carson, 2014), openness to experience (McCrae & Greenberg, 2014), psychoticism (Eysenck, 1994; Stavridou & Furnham, 1996; cf. Acar & Runco, 2012), or schizotypy (Nettle, 2006; cf. Acar & Sen, 2013), multicultural experiences (Godart, Maddux, Shipilov, & Galinsky, 2015; Leung & Chiu, 2008; Leung, Maddux, Galinsky, & Chiu, 2008; Maddux, Adam, & Galinsky, 2010; Saad, Damian, Benet-Martinez, Moons, & Robins, 2013), and diverse kinds of novel, random, incongruous, or chaotic environmental stimuli (Damian & Simonton, 2014; e.g., Ritter et al., 2012; Rothenberg, 2015; Vohs, Redden, & Rahinel, 2013). Both separately and together, these factors enable the individual to "think outside the box" and thereby conjure up combinations situated on the left side of the scatter plot in Fig. 4.1, including those rare combinations that are concomitantly original, useful, and surprising. Naturally, to the degree that free will benefits from creative thought expanding the set of choices, these same variables can be said to enhance personal freedom.

DISCUSSION

I have presented the argument that creative thoughts constitute acts of free will (Simonton, 2013b). This argument was founded on our recognizing that the BVSR theory of creativity and the chance-then-choice theory of free will can be assigned the same deep cognitive structure (cf. Doyle, 2011). In both mental phenomena, ideas are first blindly emitted, and then the most useful of those ideas are chosen. In support of this position, I demonstrated how recent formal specification of BVSR creativity could be applied with minimal modification to two-stage free will. This application has two important implications that add something new to our conception of free will.

First, given that a continuous dimension of "sightedness" measures the degree to which volitional choices are psychologically determined, free will necessarily becomes a quantitative rather than a dichotomous event. In other words, such volitional acts can vary in the magnitude of freedom displayed—just as holds for the creativity of ideas.

Second, although blindness is ensured by randomness, volitional choices can be blind without assuming any randomness. The sufficient requirement for blindness is merely that the choices are generated without complete prior knowledge of their utilities, thereby imposing the necessity for a second stage of selection or choice. Highly sighted thoughts can be neither creative nor free.

Obviously, not all acts of free will represent acts of creativity. Rather, creative thoughts constitute only a subset of all potential free acts operating under the two-stage theory. That admitted, any act of creativity must necessarily involve free choice. Furthermore, on average, the greater the magnitude of creativity, the greater the extent of freedom is. This last assertion follows logically from the argument that both mental phenomena are dependent on the magnitude of blindness involved in the initial emission of the thought or choice.

At the beginning of this chapter, I briefly observed how both creativity and personal freedom are deemed attributes of the self-actualizing personality (Maslow, 1970). At this point we can see that the connection is logical, not just empirical. The highly creative person enjoys the capacity to generate a wide range of alternative choices. Because the final choice will be governed by the individual's internal mental and emotional make-up, it is more likely that the person will make decisions that will facilitate the development of his or her human potential. Hence, self-actualization is perhaps the creator's single most important product.

Yet when Maslow (1970) discussed self-actualization, he actually treated the topic at two distinct levels. The first level is that of the ordinary person whose creativity never advances above everyday living. Researchers sometimes call this "little-c" creativity (Simonton, 2013d). Because we used the creativity definition given in Eq. (4.1), where all three parameters are subjective or personal, this chapter has also concentrated on little-c creativity. Even so, Maslow's treatment of self-actualizers also included those who can be called "Big-C" creators (Simonton, 2013d). The latter included Robert Browning, Martin Buber, George Washington Carver, Thomas Eakins, Albert Einstein, Ralph Waldo Emerson, Benjamin Franklin, Franz Joseph Haydn, Aldous Huxley, Johann Wolfgang von Goethe, David Hilbert, William James, John Keats, Thomas More, Camille Pissaro, Pierre Renoir, Baruch Spinoza, and Walt Whitman. Although this list might seem a little idiosyncratic, there can be no doubt whatsoever that each and every one left a lasting impact on the history of civilization, whether in science, philosophy, literature, art, or music. Their little-c creative thoughts became "Big-C" after becoming public, getting judged by contemporaries, and then posthumously withstanding the proverbial "test of time" (Simonton, 2010, 2013d). Each of them took their creativity to the next level, leaving their creative ideas for subsequent generations to appreciate and admire.

This extension from little to big then raises a new consideration. If creative thoughts are acts of free will, then the choices that Big-C creators make can be said to "make history." The choices made with respect to specific creative products coalesce into masterworks that exert influences that could not possibility have been anticipated. To illustrate, Pablo Picasso, when creating his most famous painting, *Guernica*, generated dozens of

sketches portraying alternative possibilities for the diverse images in the work (Simonton, 2007). These alternatives were subjected to choices that winnowed the images down to those that finally define his masterpiece— a coherent and powerful treatment of the horrors of war that continues to retain its impact. Hence, we are perfectly justified in arguing that Big-C creators are the initiators of new causal chains, of event sequences that define the history of the arts and sciences.

To be sure, sociocultural determinists would argue that Big-C creativity is not uncaused. However, as James (1880) pointed out long ago, the causes are so diverse as to lose all predictive power. Just as importantly, all of the diverse causes are necessarily funneled and filtered through each individual creator who then makes choices among the various effects of those causes, choices that would not be made by other creators. Accordingly, were Picasso to have died in his infancy, *Guernica* would not exist today. Even if the great Henri Matisse had been inspired to take up the exact same subject—which itself seems unlikely—his brush would never have produced the same painting. Both Picasso and Matisse were clearly self-actualizers, but the life and career of each involved choices that produced distinct artistic selves—and contrasting posthumous repercussions.

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LIVING A CREATIVE LIFE

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5

Creativity and Identity Formation in Adolescence: A Developmental Perspective

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Since recent years, there is a (re)emerging interest in Self- and identity-related constructs and their relation to creativity. In contrast to the humanistic perspective that has initiated this line of work in the 1950s and 1960s (e.g., Maslow, 1958; Rogers, 1954), the renewed interest in creativity and the Self is mainly anchored in the fields of social cognition and differential psychology, with a focus on creativity viewed as a "subdomain" of the self and identity (e.g., creative self-esteem, creative self-concept, creative identity). This view contrasts with humanistic, psychoanalytic, and biographic perspectives not only in terms of their theoretical anchoring but also with regard to the hypothesized directionality of the relationship between creativity and the self. While the social-cognition approach has outlined a few interactive dynamics (e.g., Karwowski & Barbot, 2016), this approach tends to focus on how several dimensions of the self may "boost" creativity. In contrast, the humanistic perspective has generally viewed the self as an outcome variable, and creativity as an independent variable on which people have agency. This view has notably emphasized the idea of creative expression of the self and outlined the possible contribution of creativity for the formation of one's identity, in "general" (i.e., not solely on the "creative identity" as a subdomain of one's identity; see, e.g., Dollinger, Urban, & James, 2004). Although the most evident nature of this relationship is reciprocal (Albert, 1996; Barbot, 2008), a focus on creativity as an independent variable has important practical implications, such as for the development of creativity-based programs designed to support

identity and psychosocial development. For such an endeavor to happen, a better understanding of how multiple facets of creativity (in particular, creative thinking, creative commitment, and creative expression) may support identity formation is essential.

After providing a developmental framework to understand the relationship between creativity and identity development, this chapter outlines three main aspects of creativity that may contribute to the development of identity (see also Barbot, 2008; Barbot & Lubart, 2012a): namely (1) creative thinking process may enhance identity formation processes; (2) creative activities represent domains of commitment leading to positive self-definition; and (3) creative activities may be used as outlets for "adaptive" self-expression. These mechanisms are illustrated in the context of adolescence, a time in which the development of both identity and creativity is particularly salient.

CREATIVITY AND IDENTITY DEVELOPMENT IN ADOLESCENCE

Adolescence is marked by intense biological, cognitive, and psychosocial changes, which have a profound impact on the development of both identity and creativity. Triggered by the onset of puberty, the asynchronous development of socioemotional and the cognitive control neurobiological system are the most characteristic features of the adolescent's brain context (Steinberg, 2008, 2009). Also caused by new environmental demands (Kroger, Martinussen, & Marcia, 2010), these neurobiological changes (and associated cognitive development) underline the developmental task of identity formation, leading to the reorganization of self-representations (e.g., Harter, 1992) and personality maturation (Barbot, 2011; Branje, Van Lieshout, & Gerris, 2007; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009). Indeed, this new identity "quest" also results from the emergence of developing cognitive abilities of formal operations, permitting abstraction, exploration of possible, and metareflection.

In Western societies, an adolescent's identity formation is often qualified as a time of "crisis" (Erikson, 1968), as it involves a significant amount of conflict and exploration engaged in the resolution of contradictions within the self. According to Marcia's (1966) identity statuses paradigm, a key to forming a mature identity in adolescence is to formulate well-defined commitments, which refer to decisions, choices, or oppositions of the adolescent in relevant ideological and interpersonal domains of life (e.g., leisure, future profession, political opinions). In a time of uncertainties about one's self—identity formation being best described by the question "who am I?"—commitments can indeed provide the adolescent with well-defined self-concepts. For example, an adolescent who has firmly

committed to athletics, such as being a soccer player, can define herself or himself as a soccer player. As such, commitments reflect one's sense of identity.

However, Marcia points out that the relative "quality" of commitments depends ultimately on the extent to which an adolescent has explored alternative commitments. Identity exploration entails the search for, discovery, and identification of possible commitments and sense of selves, specifically "who and what one might be" (Berman, Schwartz, Kurtines, & Berman, 2001, p. 513). Commitments that result from an exploration phase are more articulated, and denote a more "mature" identity structure, referred to as Identity Achievement (Marcia, 1966). On the path to Identity Achievement, adolescents often experience a phase of "Moratorium" illustrating the adolescent's "crisis" or "storm and stress." According to Marcia (1966), this identity status is marked by a quest for commitment (i.e., intense exploration of possible) with an impossibility to crystalize any stable commitment. As pointed out in the subsequent text, this status has been unsurprisingly associated with divergent thinking (DT; e.g., Barbot, 2008), a key thinking process in creativity. Two other typical identity configurations are described by Marcia (1966), both marked by a lack of exploration: Identity Diffusion (adolescents have not explored meaningful alternatives and are not seeking to formulate commitments) and Foreclosed identity (commitments are firmly held, but they do not result from a thorough, in-depth exploration). As outlined elsewhere (Barbot, 2008; Barbot & Lubart, 2012a), these configurations have an important relationship with the development of creativity because each identity configuration is associated with a set of cognitive and conative features that are differentially related to creativity.

Given the typical turmoil experienced by adolescents, and the many reorganizations in the structure of identity throughout adolescence (there is no linear progression from Identity Diffusion to Achievement), it is not surprising that the development of creativity in adolescence is characterized by "peaks, slumps, and bumps" (Barbot, Lubart, & Besançon, 2016, p. 34). Triggered by neurodevelopmental changes (e.g., Barbot & Tinio, 2015), adolescence is indeed marked by the drastic development of higher cognitive functioning including DT. Although DT starts developing very early on (e.g., Bijvoet-van den Berg & Hoicka, 2014), adolescence represents a new turn in the development of this critical component of the creative potential, characterized by a discontinuous, multifaceted, and task-specific development (e.g., Kleibeuker, De Dreu, & Crone, 2016) often punctuated by "slumps" (Barbot et al., 2016). This trend coincides with a relative increase of "divergent feelings" (Claxton, Pannells, & Rhoads, 2005), including factors such as curiosity, complexity, or risk-taking, which seems to logically align with the adolescent's identity formation context.

In sum, adolescence is a critical developmental time for the development of both identity and creativity. Although both creativity and identity seem to develop interactively, and, therefore, contribute to the development of each other, only little work has focused on the potential contribution of creativity in the formation of identity. We now turn our attention to this specific line of work with a focus on creative thinking, creative commitment, and creative expression and their specific contribution at various levels of the development of an adolescent's identity.

CREATIVE THINKING PROCESSES ARE INVOLVED IN IDENTITY FORMATION

The consensual definition of creativity defines it as the ability to produce original work that fits within a particular task or domain constraints (e.g., Runco & Jaeger, 2012; Stein, 1953; Sternberg & Lubart, 1995). Metaphorically, forming an identity may be viewed as such an "original" work (i.e., forming an individuality differentiated, unique) that must fit within the domain constraints (i.e., the individuality must fit in, and be acknowledged by the social world). Beyond the analogy between identity formation and the creative work, there is a similarity between the key thinking processes involved in identity formation and those involved in creativity. Indeed, two key thinking process factors in creativity are DT-exploratory thinking (expanding the range of solution in creative problem solving) and convergent-integrative thinking (the combining of elements in new, original, and integrative ways; e.g., Barbot, Besançon, & Lubart, 2011, 2015; Lubart, Besançon, & Barbot, 2011). These thinking processes are involved in many spheres of the human experience in which the individual has to solve problems in a creative way. As such, Identity formation may be seen as a creative process per se in which adolescents have to explore multiple alternatives about themselves (hence, engaging exploratory-DT processes), and then synthesizing at times heterogeneous elements (representations, commitments, choices, oppositions) about themselves to finally formulate an integrated "product" (engaging convergent-integrative thinking) that is both new (unique and differentiated identity) and adapted to the social world (simultaneously be "recognized by the other," social dimension of identity). This analogy with the creative work helps understand how some thinking processes may underlie both creativity and identity construction. This is illustrated by several studies, such as Berman et al. (2001) showing that in a group of 215 young adults, creativity (measured with a DT task applied to the generation of alternative solutions to hypothetical life choices dilemmas) explained 16% of the variance in identity exploration scores. Supporting

this result, further research using classic DT tests (graphics or verbal domains) showed association between fluency, the quantity of ideas generated in response to a unique problem or stimulus, and quantity exploration involved in the construction of identity (e.g., Dollinger, Clancy Dollinger, & Centeno, 2005).

Similarly, in a study of more than 1100 middle and high school French adolescents (Barbot, 2008), we showed that adolescents in a Moratorium identity status—intense exploration of identity associated with a quest for commitments—had higher DT performance in a classic graphics task (both fluency and originality), compared to adolescents in other identity configurations. We concluded that the stimulation of DT through creative activity could be an effective strategy to trigger the exploration of possible commitments (or their reconsideration). Expanding on this, prior research has indicated that self-identified creative individuals engage in multiple divergent processes, including broadening, or methods to increase their knowledge of areas outside their expertise (Epstein & Phan, 2012), which, in turn, could contribute to identity exploration. In support of this hypothesis, Steffens, Gocowska, Cruwys, and Galinsky (2015) also indicated that the ability to develop many original ideas was associated with having multiple social group identities.

Regarding convergent-integrative thinking processes involved in creativity, they are equally important in the process of identity formation. Although not yet supported by empirical evidences, it is theoretically expected that the formulation of commitments engages convergent-integrative processes (decision making being by definition a convergent process). Convergent-integrative processes can also be involved in the resolution of conflicts and contradictions within the self. At the beginning of adolescence, the apparition of contradicting self-representations (e.g., the self-concept of being someone "introvert" in the family environment, and, at the same time, "extrovert" within a group of peer) can lead to a distressing feeling of inconsistency, confusion, and even dissociation. Progressively, the adolescent learns to integrate these contradicting selves as part of a broader, more flexible definition of himself or herself (see Harter, 2003). This process illustrates how convergent-integrative thinking processes can help build a coherent sense of identity by combining and resolving heterogeneous, and sometimes conflicting, self-representations.

Other processes involved in creativity may be at play in the formation of one's identity. In particular, seeking for originality in creative production may contribute to the process of differentiation–individuation, as illustrated by Joy (2001). His study showed a relationship between the "need to be different" and the originality of responses in classic DT tests. This result is consistent with Helson and Pals (2000) pointing out the importance of a coherent identity for integrating and channeling creative potential.

CREATIVE COMMITMENTS PROVIDE ATTRIBUTES FOR SELF-DEFINITION AND LEAD TO POSITIVE SELF-ESTEEM

As outlined earlier, commitments reflect one's sense of identity. They have a social meaning and provide to the individual some attributes to define themselves when answering the question "who am I?" For example, being part of a music band will provide an adolescent the self-concept of being "a musician" or "a singer." This self-concept can be associated with a self-evaluation of positive or negative valence (e.g., I am a "good" musician), referring to domain-specific self-esteem. Typically, a self-evaluation of negative valence may lead to a disengagement of the adolescent in the domain in question. Mechanisms underlying the disengagement from creative outlets have recently been described (see Beghetto, 2014; Beghetto & Dilley, 2016; concept of *creative mortification* referring to the loss of one's willingness to pursue a particular creative aspiration following a negative performance outcome). Regardless of this dynamic, people naturally attempt to "protect" their self and, therefore, tend to avoid situations that would lead to negative performance outcomes and generate negative self-esteem. As a result, adolescents committed to a given creative outlet, sports, or other performance domains generally maintain a positive self-esteem in these specific domains. These positive domain-specific self-beliefs [or Creative Self-Beliefs (CSB)] may, in turn, contribute to the performance outcome in the domain in question (which is the main focus of CSB research so far, e.g., Karwowski & Barbot, 2016), but they could also "carry over" to other domains of self-representation, leading to a more positive self-representation, in "general" (i.e., regardless of the performance domain). This, perhaps, is particularly true if the creative outlet in which the adolescents are engaged becomes an important component of their identity and the definition of themselves.

The importance attributed by adolescents to creativity in the overall definition of themselves refers to "creative personal identity" (Jaussi, Randel, & Dionne, 2007). In addition to particular interests and commitments in a given creative activity, this importance is determined by past experiences and opportunities to express their creativity. Adolescents for whom creativity is an important part of the definition of themselves seek opportunities to be creative in order to maintain a positive image and to affirm this fundamental aspect of themselves. Hence, there is a cyclic relationship between creative identity and creative activity (Petkus, 1996). One way to strengthen the creative identity might be to encourage self-efficacy for creative work, which is itself improved by feedback received on creative work (Beghetto, 2006; Karwowski, 2016).

Supporting the aforementioned assumptions on the dynamic between individual interests and commitments in creative activities, creative

identity, and a positive self-representation in general, several studies have showed important associations between aspects of creativity (especially exploratory-DT processes) and self-esteem (see Coopersmith, 1967) or self-efficacy (e.g., Freeman, 1993; Jaussi et al., 2007; Tierney & Farmer, 2002). This line of work has, however, proved controversial as it has not always confirmed relationship between creativity and various dimensions of the self, in particular, self-esteem (Auh, 1997; Jaquish & Ripple, 1980). In related work (e.g., Barbot, Curtis, & Miller, 2014), we have proposed that these mixed findings may be due to the domain specificity of both creativity and self-esteem, such that domain-specific self-esteem may be associated with domain-relevant creativity. We illustrated this phenomenon in a pilot study of 42 adolescents who were administered product-based creativity tasks in three domains (verbal, graphic, and musical) and a multidimensional self-esteem scale. Results demonstrated a positive relationship between creative self-esteem and creative drawing but not creativity in other domains. Among other notable results, 35% of the variance in musical creativity scores (as measured by the MET; Barbot & Lubart, 2012b) was explained by domain-specific self-esteem in emotional, physical, and social domains. Physical self-esteem (related to self-perceived appearance and physical performance as well as a sense of feeling good about one's body) was also related to the quantity and originality of musical exploratory behavior engaged in the creative process in music. Thus, physical self-esteem may be important for the expression of musical creativity and not necessarily for another domain of expression such as writing, perhaps because through the instrumental gesture, music involves the body. Regardless, these findings illustrate how domain-specific self-beliefs can be associated with creativity in domain-relevant fields, and, by extension, encouraging creative activity in specific domains or activity might triggers positive self-beliefs in specifics areas that are relevant to that domain.

CREATIVITY GIVES OUTLETS FOR ADAPTIVE SELF-EXPRESSION

Self-expression refers to the expression of thoughts, ideas, feelings, and emotions that, when not manifested verbally in interpersonal contexts, are preferably expressed through creative activity. In a context of internal conflicts and environmental pressures that generate stress and negative effects, adolescents seek ways to externalize their distress through multiple outlets. Given the dimension of self-expression engaged in the creative activity, creativity may be seen as a form of resiliency mechanism to overcome anxiety and stress associated with the normative, yet often distressing developmental tasks of adolescence. When not channeled into creative self-expression within creative outlets, expression of internal or

external distress may "spill" in maladaptive forms of expression such as aggression and violence. Hence, fostering creative expression may be an effective way to "derive" these manifestations of distress in more adaptive ways (Barbot & Lubart, 2012a).

Several lines of empirical work have supported this idea. For example, Carson, Bittner, Cameron, Brown, and Meyer (1994) showed that aspects of DT production (particularly fluency and originality of ideas) were strongly associated with preadolescents' adaptive capacities and ability to cope in stressful situations. These results are backed up by a large body of research in the field of emotions and creativity showing that "creative answers" are common reaction to intense emotions, whether positive or negative (e.g., Baas, De Dreu, & Nijstad, 2008; Byron, Khazanchi, & Nazarian, 2010; Davis, 2009). As such, creative self-expression may serve as a buffer for the adolescent's typical "storm and stress."

However, the ability to express one's inner feeling in a creative outlet usually engages some degree of domain-specific knowledge, and technical mastery, necessary to achieve a certain level of expressivity. As a result, self-expression through creative outlets may not naturally occur, but, rather, could result from a sustained level of interest, motivation, and perseverance. This is consistent with the idea that identification with activities is another facet through which defining one's self occurs, particularly when the task involves increased engagement, effort, and persistence (Munson & Widmer, 1997). That said, creative self-expression is not limited to intrinsically creative tasks in nature, but encompasses activities in which an individual reaches a form of self-actualization, including noncreative leisure activities (Munson & Widmer, 1997; Shaw, Kleiber, & Caldwell, 1995).

Self-expression through creative outlets is also a way to "discover" the self. For instance, Hunt and Sampson (1998) suggest that creative writing techniques act as an expression of an individual's social and personal roles. Indeed, the symbolic meaning of creative activities engagement provides "identity images," or self-statements referring to individual traits (see, e.g., Haggard & Williams, 1992; referring to leisure activities, in general) and social affiliation (Feinstein, Bynner, & Duckworth, 2006). This is well illustrated in other domains of expression such as in music, in which commitments to a given musical genre often mark a specific affiliation to a social group and endorsement of a set of personal features (e.g., being in a rock band is associated with a number of personal and social identity attributes that are clearly contrasted with those associated with other musical genres such as hip-hop or electronic music). In this example, finding the musical genre in which an adolescent best expresses himself or herself will provide him or her with a set of "new" self-knowledge through his or her identification and implicit affiliation to a social group, and through the creative outputs themselves (as an expression of the self, creativity can

help "discover" one's self both in the act of producing a creative output and through interpretation of that output).

CONCLUSION

Many resources important for both creativity and identity (cognitive factors, personality traits, interests, environmental influences) are subject to reorganization during adolescence, and there are therefore multiple reasons why their development may "align" (Barbot, 2008; Barbot et al., 2016). By extension, we have illustrated throughout this chapter how thinking processes, commitment and self-expression involved in creativity, play an essential role in the formation of an adolescent's identity. These dimensions of creativity correspondingly (1) strengthen the thinking process involved in identity formation (e.g., exploration, commitment, and differentiation–individuation), (2) provide the adolescents with social and personal attributes for self-definition, leading to a positive self-esteem, and (3) give adolescents outlets for adaptive self-expression, representing a form of resiliency in a context of uncertainties about the self, internal distress, and external pressures that may otherwise lead to maladaptive self-expression such as aggressiveness and violence.

In an applied perspective, engaging in creative activity (in a sufficiently structured and targeted way) could be beneficial and lead to a real self-transformation. Creative thinking, commitment, and expression might help adolescent discover their own potential and uniqueness, and provide them the resources to develop with sufficient flexibility in their adult lives. Unfortunately, to date, the importance of creativity for the optimal development of adolescents appears still underestimated (limited research, little to no consideration as part of the psychological assessment, rather repressed than encouraged in educational settings). This is perhaps because naïve representations, including by adolescents themselves, associate creativity with a childish and playful attitude, whereas it is expected that teenagers learn to "behave like adults." Hence, under the influence of the social environment, many adolescents abandon this important component of themselves.

Considerable research efforts are still needed to better understand creativity development, how it becomes a more domain-specific phenomenon, why adolescents' creativity slumps sometimes never "recover" into adulthood, and its developmental interaction with identity formation. A better understanding of these phenomena will contribute to better situate the importance of creativity in adolescence and how it should be promoted (or not) to support an optimal psychosocial development.

Acknowledgments

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Self-Construction and Creative "Life Design"

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The Self is composed of several facets, founding a psychological entity that is coherent and relatively stable over time but in constant evolution and mutation. Creativity is an essential resource in the construction and the development of a person's identity (Barbot, 2008; Barbot & Lubart, 2012; Getz & Lubart, 1998). The representation of Self is a key to the exploration of a person's future occupation or professional life and related vocational decisions. Creativity contributes to the ability to set one's course in life and to define one's orientation. Bergson (1907) noted that the creation of the Self, which each individual accomplishes, renders human life an inherently creative act, and enriches the world. In this chapter, we will explore the importance of creativity in developing the Self, with a perspective inspired from counseling psychology.

SELF AND IDENTITY

A Dynamic, Integrative Conception

Identity can be considered as a dynamic and integrative concept within the phenomenological and interactionist approaches. In this context, it can be addressed both from the subjective point of view, with the establishment of a Self or self-consciousness, and from a relational perspective because self-consciousness is a product of social interactions. It is clear that the construction of identity is a complex process; each individual is both unique and similar to others (Lipiansky, 2008). The "self-concept" can be described as involving an objective part corresponding to permanent characteristics (e.g., age or gender) and a subjective part, the consciousness

that each person has to be himself or herself, in other words unique, and to be the same individual throughout life.

The Self is both individual and collective, personal and social. It expresses membership in communities and is an immediate part of consciousness, "I am I." It involves also a reflexive movement by which the individual tends to seek internal coherence, consistency, and completeness of existence. The Self includes idiosyncrasy but also similarity to others, the individual and the social group, objective and subjective points of view, continuity, and change (Bardou & Oubrayrie-Roussel, 2014; Lipiansky, 2008).

Identity construction, in which the Self is built, is a long-term process that involves several subprocesses (Lipiansky, 2008):

- an individuation or differentiation process involved mainly in the early years through which the child manages to see himself/herself as a differentiated being;
- an identification process by which the individual appropriates the characteristics of others, finds patterns, and feels solidarity with some communities;
- an attribution process leading to internalization of the images and the feedback that comes from others;
- a narcissistic valuation process: the Self is emotionally invested;
- a conservation process for temporal continuity in self-awareness and giving a sense of permanence;
- a process of realization that identity cannot be reduced to the perpetuation of the past but opens the future possibilities through the pursuit of an ideal and fulfillment of a life project.

The aforementioned processes are dynamic and progressive, and do not have the same shape and the same importance at different ages. The evolution of the sense of identity is far from linear, because there are changes linked to experiences and life events. Finally, these processes seek to maintain homeostasis, an equilibrium between diverse forces and influences on the individual. Identity is a search for self-definition; it builds on the continuity of self-consciousness despite the changes that occur constantly (Lipiansky, 2008).

The "sense of identity" refers to the self-representation that a person has, being aware that this self-representation is a broad concept valid across situations but nevertheless evolving over time (Eustache, 2013). We can conclude that identity is a multidimensional system, as suggested by Bardou and Oubrayrie-Roussel (2014), structured around several dimensions: continuity, consistency (unity), valuation (self-assessment, self-esteem), internal differentiation (feeling of diversity), external differentiation (desire for autonomy), assertiveness, originality (uniqueness), and resilience (coping).

In terms of creativity, the emergence of a self-concept, the construction of identity, and the distinction between self and others are all essential developmental acts that each person accomplishes during his or her life. They are acts of "mini-c" creativity (Kaufman & Beghetto, 2009), creativity at the most primary, basic, and individual level. In this way, the development of self is, perhaps, the most universal example of creativity at a personal level.

Identity: Developmental Approaches

Cohen-Scali and Guichard (2008) analyze how the individual manages to construct a coherent representation of himself or herself, from his/her past and considering what he/she wants to become. They show that the debate surrounding the work of Erikson (1956, 1959, 1972) and Marcia (1966, 1993), as well as extensions of these approaches, provides a number of significant elements allowing them to orient counseling. The major issue of adolescence and emerging adulthood is identity construction. This proceeds from a sentiment of identity that develops over time through interaction with important others in diverse contexts. However, this anticipated identity must still be completed, transformed, and developed. Identity construction is not "monolithic." First, it can fluctuate significantly from one domain of life to another. Thus, the notion of "achieved identity" appears to be challenged. Second, processes mobilized in the construction of identity appear much more complex than a certain combination of exploration and commitment. The authors conclude that developmental approaches to identity lead to the conception of a "plural" subject (many selves) whose development processes are, also, plural.

The Self: Some Specificities

The Self and identity are closely related concepts (Tap & Sordes-Ader, 2012). The Self refers to an organized configuration of perceptions of who one is. Self-concept is defined as an "overall vision (as an integrated, coherent, and stable individuality) transcending the experiential and event content of self-awareness" (Lipiansky, 2008, p. 38). It is important to distinguish between identity and self-concept; identity consists of representations and feelings and cannot be reduced to a purely cognitive system. "Self-concept" focuses on the cognitive dimension of the Self (Tap & Sordes-Ader, 2012). The question of skills that one possesses, which are relevant to career choices, is part of the study of self-concept.

There is furthermore a consensus among researchers to consider that the Self is composed of several facets related to different areas of each individual's life. Thus, among these facets called "self-specific concepts," we find the following: the academic self-concept, the professional

self-concept, self-concept in social relationships, or self-concept in sport. An individual could possess self-concepts with different levels of specificity and these could be organized hierarchically from the most specific to the most generic (Brunot, 2007). The accumulation and progressive prioritization of various self-specific concepts, followed by the organization and integration of these diverse self-images, results in a complete, but complex self-representation (Bardou & Oubrayrie-Roussel, 2014).

The Self as a Sculpture

The process of representing a concept, such as the Self is a mental activity that takes place over time, and involves numerous phases of adding, deleting, and modifying an initial concept. Self-representation is, in fact, never finished—until one's life ends. Metaphorically, each person is a sculptor, in the process of sculpting his or her self. François Jacob, Nobel laureate in medicine, described in his autobiography (*The Inner Statue*) his self-concept and its evolution:

> I carry in me, carved from childhood, a kind of inner statue that gives continuity to my life, which is the most intimate part, the hardest core of my character. This statue I modeled all my life. I incessantly made edits. I refined it. I polished it. The gouge and chisel here are meetings and combinations. Rhythms jostling. Stray pages of a chapter that slip into another based on the timing of emotions. … I am not only home to an ideal character with which I am confronted constantly. I bear also a series of moral figures, with perfectly contradictory qualities, that my imagination is always ready to play as my partners in situations and dialogues etched in my mind since my childhood and my adolescence. For all roles in that possible repertory, for all tasks around me which affect me directly, I have inside me the actors ready to respond in the comedies and tragedies written inside myself since a long time. There is not a move, not a word that is not imposed by my inside statue. *Jacob (1987, pp. 24–25)*

Each individual is involved in this creative process, which is perhaps the most essential creative act in a person's life. However, there are differences in the creation of this inner sculpture from one person to another. These differences concern both the "process" of identity formation and the "product" of the resulting self.

In terms of the process, people may devote more or less time and attention to their inner sculpture. Some may "copy" their self-concept from role models who they observe in their social environment. Some people may follow imposed guidelines or suggestions, offered by parents or peers. These would be cases in which the "creative" nature of the self-identity constructive process is minimal. Others may reflect introspectively and engage in an intense and continuous remodeling of the self. This would represent a strong involvement in the creative self-identity construction process.

In terms of the "finished product," the resulting Self may be more or less "original" compared to others in a person's social environment. This originality corresponds to the more or less idiosyncratic nature of the Self that results from identity construction at any specific moment in a person's life. Thus, a person may have an original, statistically rare self-concept during one phase of life, but move toward a more typical self-concept at a different moment in life. The notion of idiosyncrasy in terms of self-concept requires some clarification. Each person has an idiosyncratic self-concept, which is in some way "unique." However, if we compare an individual's self-concept to others in the social world, we will observe more or less similarities. In this way, the degree of idiosyncrasy, or "originality," can be conceptualized.

It is likely that a strong engagement in the creative process to construct one's self-concept will favor the emergence of a self-concept that is original and highly idiosyncratic, but this is not a strict consequence of engaging fully the creative process of identity construction. Indeed, the end result of a creative exploration may be a relatively conventional self-concept. One could think of teenagers or young adults who seek their own path to becoming who they are. This would be a creative act of self-construction. Many may, nevertheless, design a self-concept that resembles other teens. Then the result is not very original. We would argue that the creative nature of the self-constructive process is the key more than the novel nature of the resulting Self.

In addition to the degree of creativity that characterizes a person's self-concept, it is important to note that the content of the self-concept may include creativity more or less. In other words, does the individual see himself or herself as a creative person, an individual with the capacity to create in their professional domain, or in their personal life activities? This self-representation, in terms of being a creative person, may be favored by engaging the creative process in identity formation, and holding a self-concept that is relatively original.

THE SELF IN COUNSELING PSYCHOLOGY

The Concept of the "Project"

The project refers to a goal state for the Self. It is an intention, and the project involves the plan to get to the desired goal. It could refer exclusively to the professional domain (professional project) or to a broader lifestyle (life project). By definition, the project includes intentions, the definition of a goal, and its link with the means of reaching the goal.

The "project" is central in counseling psychology. For Young and Valach (2006), the project (1) involves an action or series of actions that

are long-term, such as an action during the life span or long-term career; (2) is not limited to the professional field; (3) is socially constructed and has a relational nature; (4) is multidetermined but partly underdetermined and open to change; and (5) is a way of both organizing one's past experiences (retrospective) and anticipating one's future experiences (prospective). According to Huteau (1995), it is natural that counseling psychology focuses on projects because they are particularly valued forms of anticipation or projections into the future.

Cognitive processes guide decision making and choosing or not choosing itineraries that the individual has envisioned as a project. Zittoun and de Saint Laurent (2014) highlight the role of imagination in generating possible alternatives, which enrich the decision-making options. In this optic, creative thinking, at least in terms of divergent thinking and flexibility, appears as a very relevant resource to generate alternative projects. Tap and Oubrayrie (1993) point out also the importance of childhood experiences, sexuality, and current social context in the emergence of the projects, particularly in adolescence. The personal project is an "intellectual entity, a form of representation that integrates the current state of what the individual knows about himself or herself (self-knowledge) and what he or she knows about the outside world (world of work, school system, etc.). It is a 'representative interpretation of the current and anticipated place of the individual in the world' (Richard, Baldy, Baldy, & Benedetto, 1992, p. 54). The project's qualities depend first on its data (representations of Self and the world) and then how these are put together. Part of these data relate to real elements that exist, whereas others refer to future, imaginary aspects that must be anticipated. The life project is a guiding light that organizes the trajectory desired by the individual. The life project encompasses several subprojects, which are more or less coherent and developed or fragmented (Pemartin, 1995). In this context, the professional project is just one of these subprojects.

The Self: A Key Role in Project Momentum

Defining one's project, resolving the difficulties encountered to achieve this project, and potentially redefining it as it evolves, can be considered each person's main problem-solving task in terms of identity development. The Self and, more specifically, one's self-concept occupy an important place in the psychology of the project. The project can be conceived as an early depiction of a situation to materialize the possible self.

Before projects, there is a period when the child develops his or her imagination and envisions various roles, jobs, or selves. The child imagines the role of being a doctor, a professor, a dancer, a firefighter, or a security officer. These projects are developed based on episodes

from daily life (Grinschpoun, 2013). These imaginary expectations are essential for the formation of the project. This is a period of time when self-representations develop without any practical feasibility: "I am what I imagine I will be" (Erikson, 1972, p. 126). The project is thus experienced as a game, a dream. It is, by nature, a hypothetical reality, a possible future.

The project represents an ideal image and has fantasy-like aspects. Thus, it is an ideal to be achieved, a projected future (Baudouin, 2007; Costalat-Founeau, 1994). The unfolding, temporal aspect of a person's project, is a central feature that leads the self to be, more or less, a "work in progress." For Guichard and Huteau (2006), two main stages can be distinguished in the construction of a project: (1) exploration in which the individual generates a range of possibilities and (2) the decision where some possibilities are selected and prioritized. Planning, which allows the subject to build a strategy and put in place the means that should enable reaching one's goals, is present from exploration. Also, in addition to the two phases of the project construction period (exploration, decision), an adaptation phase must be added, with the individual adjusting his or her project based on reactions from the social context.

For Pemartin (1995), the construction of a project involves, by definition, the person, and his or her representation of the environment and of himself or herself. Every professional project refers essentially to a "representation." Thus one can understand the importance of the concept of representation in counseling psychology in terms of either "self-representation" or "professional representation." Huteau (1982) suggests that preferences with respect to professional activities are essentially based on a comparison between self-representations and representations of professions. Possible professional goals are possible selves: they become real goals if certain conditions relating to their estimated value and the ability to be reached are met. Self-representation is at the heart of the exploration of future professionals and decision processes. When the individual does not have a well-developed self-representation or a negative one, it leads to a state of psychological discomfort and, in some cases, anxiety that blocks the construction of projects (Guichard & Huteau, 2006).

New Perspectives in Career Counseling Psychology

The globalization of trade, technological progress, and the telecommunication revolution have changed dramatically the economy, the daily lives of individuals, lifestyles, family and social relations, and modes of thinking. With regard to guidance, individual behaviors, and decisions take place in a world marked by jobs that evolve, mixing previously distinct work domains and increasing the risk of insecurity. School and career paths are more open, more complex, and uncertain, and transitions have

multiplied. Under these conditions, a reflection on career orientation becomes an individual investigation about who a person is throughout his or her life, a reflection about the Self in a changing context, and counseling psychology encompasses the psychology of identity formation, which takes the form of coaching a person in their process of creating their self.

This has called into question models used in counseling psychology since the 20th century, which assumed a certain job stability. Part of these models were based on the person–environment fit and reliability of the expected adaptation based on ability or personality profiles with educational models focusing on a long-term professional project and trainability during adolescence in particular. We will consider now several conceptions of the individual-context dialectic. We will see that this relationship involves a dynamic interaction and will discuss the role of creativity in guidance counseling throughout the lifespan.

The links between individuals and occupations or professional situations have been extensively investigated in differential psychology. This work is based on the premise that there is a certain stability of individual personalities or backgrounds. Different dimensions are taken into account when matching individuals and occupations: skills, interests, and values.

The link between occupational choice and personality was at the heart of much research. In particular, professional interests in the RIASEC typology (Holland, 1973) were widely used in industrialized countries. Holland built his typological theory of personality based on two ideas:

1. Professional choice is an expression of personality in its entirety (skills, personality traits, lifestyles, and relationships).
2. The degree of agreement between an individual and a professional environment has implications for career success, stability, and satisfaction.

The typological profile of an individual can predict the type of work environment that suits him or her best. This theory is based on the assumption that people who practice the same profession share the same interests, and have personal experiences and personalities that are similar.

In terms of the development of personal and professional careers, Super's (1957, 1963) conception of the genesis of preferences and career choices is also particularly important. Super's theory is based on two fundamental assumptions: first, human development is a continuous process and, second, the development of the professional career involves forming and achieving a professional self-concept. In Super's model, professional choice is presented, as in many other models, in the form of a "self-profession" pairing. The differences between individuals relate to their abilities, personalities, needs, values, interests, and self-concept. Their characteristics are more or less in line with the abilities and personality traits necessary for the exercise of a given profession. The quality of the match

has an impact on social and professional integration. The individual's satisfaction is related to the possibility that he or she could self-actualize. Professional choice is thus conceived as a process of improving, over one's working life, the balance between Self and environment. Self-concepts are conceptualized as the subjective perspective of the individual as opposed to the "objective" view of Self seen by others or one's imposed vocational identity. Professional self-concepts refer to a person's life story, which renders these concepts very individual. These self-concepts are a portrait of the individual in a specific role, in a specific position, taking care of a set of job functions, in a certain social network. The basic premise of Super's theory is that the individual seeks to actualize his or her professional concept throughout the career (see Guichard & Huteau, 2006 for a discussion).

THE CONSTRUCTIVIST PERSPECTIVE

In the constructivist perspective, the Self is not conceived as a "thing" but as a general reflexive process that has a structuring function on interactions in the individual's context. In this approach, Savickas et al. (2010) promote using "life-design" and Guichard (2004) favors "Self-design." The disappearance of industrial-era prototypical career models in favor of new forms of careers without borders has raised the question about the models and methods used in guidance counseling for the 21st century. The constructivist concept of careers led Savickas et al. (2010) to provide a new interpretation of certain notions of counseling psychology. For example, "interests" are considered as socially shared meanings and seen as dynamic processes and not as stable traits. For Savickas and coworkers, current theories and techniques of guidance are in crisis because their main goal is predictability—based on the notions of stability and stages of careers—which seems questionable and perhaps implausible. To support this view, they note that human behavior depends on not only the person but also the environment. Savickas and coworkers argue also that individual factors, such as professional interests are much less stable than Holland (1973) proposed and that career paths, as conceived in many existing theories (Super, 1957), are largely shaped by the needs of a given society. A stable labor market leads to a career marked by stages. This notion is, however, not relevant with a tense and changing labor market. The dynamism of interests and unstable labor contexts leads Savickas and coworkers to question the model of "career readiness/career maturity" defended by Super.

For Savickas and coworkers, this justifies the need for theoretical models focusing on human flexibility, adaptability, and training throughout life. Creativity is therefore seen as increasingly important in counseling psychology; new accompanying guidance methods should adopt a

dynamic approach by stimulating creative thinking and exploration of possible "selves." Such models and methods need to allow individuals to engage in a continuous process of career orientation. The life-designing expression "build your life" proposes to redefine even what guidance involves. According to this view, "life design" is a natural human activity, and the counselor provides a framework for reflection. In a life-design counseling interview, the individual's reflective thinking activity is the central element. This perspective places the individual's natural creative process as the central element of career counseling. Zittoun and de Saint Laurent (2014) use the term "life creativity" to refer to the generation of one's own life trajectory.

The Self-Construction Approach

Self-construction focuses on the existential aspect of "self," which leads to the question "what am I going to do with myself?" For Guichard and Huteau (2007, p. 108), "self-construction involves all the factors and processes (social and individual) enabling an individual to direct his or her existence and thus to try to fulfill what is his or her vision at a given moment." In this view, the individual directs his or her life and refers to himself or herself in a certain social context. Individuals act, interact, and dialogue in social and language frameworks. Through their exchanges, individuals contribute to the evolution of these contexts in which they "own" certain elements. Some of these are essential in the construction of self; this cognitive development generates, among other things, "cognitive identity frames," which are mental patterns for various groups and social categories. "Individual identity" is thus conceived as an evolving system of identity. In the constructivist model, orientation practices concern the system of subjective identity forms that need to be developed. This requires guidance counselors to help map the system, to determine a person's subjective identity forms, and to identify activities and interactions that will offer the individual the opportunity to build on these forms.

The Individual-Context Relationship: A "Dynamic Interaction"

Analyzing the conceptual evolution of the dialectic individual context in sociological and psychological theories of identity, Dumora, Aisenson, Aisenson, Cohen-Scali, and Pouyaud (2008) conclude that the individual-context relationship is a mutual adaptive process between an active subject (with his or her specific characteristics in terms of expectations, preferences, and values) and structured contexts themselves interconnected and changing. Under these conditions, we understand the importance of the concept of "individual-context" fit, which is close to the matching congruence postulate in models that have long-dominated

orientation. For Dumora et al., the proper fit of self-context relationships has no value in a simple match made once and for all; it is essentially open to change and the activity–reactivity of the two entities concerned. Both the individual and the context evolve over time, in part, due to their interaction, and in part due to external influences on the person in the context. Professional and personal transitions pose the question of identity modifications. Continuous careers are increasingly less common and individuals are consequently often subjected to breaks in their careers. These "breaks" or "transitions" are opportunities to invent, or reinvent, the Self (Dupuy, 1998). The transitions allow a person to preserve certain roles but also to generate a new identity balance. The path to access new self-identities (information search, looking for new memberships, training, etc.) involves processes of self-evaluation and social comparison, the contribution of social support, emotional regulation of stress caused by the novelty and uncertainty, reflection on past actions, and anticipation of desired future identities.

In a social constructivist approach to identity and professional projects, Mary and Costalat-Founeau (2014) conducted an investigation using the multistage investigation of social identity with participants engaged in a process of skills assessment and explored the interactions between the project, actions, and social constructs. They concluded that these interactions form an identity dynamic systemic loop and show that the construction of new projects involves questioning identity, by giving new meaning to one's actions and relationships to others. Individuals who engage simultaneously in a redefinition of their personal and professional projects may initiate a transition in their psychosocial identity.

CREATIVITY AS A RELEVANT RESOURCE FOR SELF-CONSTRUCTION

During the past decades, several authors have pointed out the potential implications of creativity in the field of career counseling (Amundson, 1998; Frey, 1975; Heppner, O'Brien, Hinkelman, & Humphrey, 1994; McMahon, 2016; Morgan & Skovholt, 1997; Pyle, 1984). An early author declared that "in its broadest sense, counseling is actually a creative enterprise within which the client and counselor combine their resources to generate a new plan, develop a different outlook, formulate alternative behaviors, begin a new life" (Frey, 1975, p. 23). Furthermore, Heppner, Fitzgerald, and Jones (1989) described all the creative aspects that underlie the counseling process and the interaction between a counselor and a counselee. In the same vein, Heppner et al. (1994) suggested using creative methods for both increasing students' interests and motivation to be involved in career education programs and helping them "in

achieving their dreams and maximizing their creative potentials" (p. 85). At the beginning of the 21st century, the growing importance of constructivist approaches to career counseling has generated new interests for creativity among both practitioners and theorists. Indeed, according to McMahon (2016), these approaches involve several creative aspects, such as thinking about career choices and designing future life. However, she noted also the need to explore thoroughly the role of creativity in career counseling. Based on a literature review, we identified three main implications: (1) creative career counseling techniques, (2) creativity as a resource during career decision-making process, and (3) creativity as a resource to design life and career paths.

Creative Career Counseling Techniques

Traditionally, career counseling practices are not perceived as creative. Heppner et al. (1994) reported that lack of creativity among career practitioners was a discouraging aspect that leads college students to develop few interests for participating in career-related activities. As an explanation, McMahon (2016) suggested that trait and factor theories continue to dominate practice and this entails a linear career intervention with the focus on the exploration of career interests and matching occupational themes using computer-assisted assessment. Alternatively, Heppner et al. (1994, unpublished) suggested several creative techniques that may be useful in career counseling settings including the following: guided imagery, idea journals, career genograms, metaphors, and art-based activities. In the constructivist approaches to career counseling, many of these techniques are used as critical support to coconstruct and to design one's future. For example, uses of appropriate metaphors during interviews are recommended regarding their facilitating role to foster a working alliance between the counselor and the counselee as well as creative reflections about career among clients (Inkson, 2004; Inkson & Amundson, 2002).

An illustration of a creative counseling technique can be found in a career development workshop that was designed to engage adolescents to use theater and visual arts to foster their self-construction (de Valverde, 2007). The workshop was divided into a sequence of six activities: (1) "Your first name standing up," expressed in three dimensions, reflecting the individual's personality; (2) "Image bank," involving the selection of pictures that illustrate for the individual the topics of one's body, love, work, leisure, nature, architecture, and societal phenomena; (3) "one quality, one fault," illustrated graphically with drawings or collage; (4) "I like/I don't like" illustrated in the same visual space with mixed media; (5) "I want/I don't want" illustrated visually in a shared space of

the possible futures; and (6) a final collective work that unites elements from the five initial steps from each individual in the school classroom. In this workshop, there is a progression from self-exploration and knowledge that allows participants to create possible futures and to share these creations and representations with their classmates. As mentioned by Heppner et al. (1994, unpublished), using art mediums during a career intervention are particularly relevant to help individuals to express their mental representations and start a discussion with them.

Creativity as a Resource During the Career Decision-Making Process

Research examining the role of creativity during the career decision-making process is also very recent. For example, in a study conducted among 202 Korean college students, Jeong (2007) demonstrated that those reporting a low level of creativity were more likely to experience career indecision. Similarly, with another sample of 741 Korean college students, creativity was strongly and positively related to self-identity ($r = 0.50$) and career decision status ($r = 0.21$) (Jung, 2010). Connections with career adaptability were also found (Jeong, 2013; Patillon, T.-V., 2014). These results may provide support for the theoretical assumptions of McMahon (2016): creative accomplishments may foster the development of self-concept and identity (Dollinger, Dollinger, & Centeno, 2005). Nevertheless, one major limitation of all these results is that various measures and definitions of creativity were used. Researchers need to pay more attention to the theoretical and practical implications of using different facets of this concept (McMahon, 2016).

Creativity as a Resource to Design Life and Career Paths

The future implies various representations of the self, life, education, work, and society. Cognitive and emotional patterns from which young people see themselves are organized over time, in particular during adolescence (Aisenson, 2005). During development from childhood to adolescence, the construction of the self-concept is at the heart of individuation and socialization processes. The choice of a profession is a major identity issue for adolescents, who are solicited to express what they hope to become (Guichard & Huteau, 2006). All of these models emphasize, moreover, the role of schools, including assessments practiced there and the social reality that the young person encounters. The school's social role is to partially "frame" identity, limiting outlandish ideas but also boosting those adolescents whose identity concept is too modest.

A person's future project seems determined at different levels (institutional, contextual, and individual), which must be articulated to understand how the project develops in adolescence. In this vein, Guitard (2000) describes several dynamics:

- the socioeconomic dynamic that involves ideological determinism, belief systems and representations, and evaluations and standards that justify the perceived system of social and economic relations;
- psychosocial dynamics involved in the construction of personal projects through the family and school;
- the psychological dynamics that is in fact a self-realization process, involving the project.

All of the reflections about the Self and the project suggest that this line of work is a central topic in creativity at the personal level. It is therefore a clear example of mini-c creativity (Kaufman & Beghetto, 2009). To the extent that a person develops a self-concept and personal project that is different from frequently observed projects in the relevant peer group is possible to consider the self-concept or project in terms of little-c creativity as well.

Creativity represents, therefore, an important resource in identity construction and the development of a life project. To help youth build their identity and life project is a valuable goal of educational systems, which can be facilitated through guidance counseling activities. These activities can be used to allow individuals to "write their own life story," being both the subject of this story and its author (Grosbras, 1998). This kind of approach invites people to analyze their situation and self-representation, and to envision possible future selves that add value to the individual's life purpose and existence.

CONCLUSION

In this chapter, we have explored the concepts of Self, identity, and their development. Our analysis of identity and personal development suggests that the construction of a professional project is a central developmental task that can be considered as a product of personal creativity. Accompanying individuals during transitions through guidance counseling activities take into account the role of the Self and developmental potential. A potential regardless of its level will not necessarily develop spontaneously. It must be nurtured by an appropriate and supportive environment. In a world where the need for self-actualization increases and the sense of accomplishment can be very difficult to achieve, it seems important to extend the reflection on the project and the role of the Self to the expression of potential. As the development of one's self-concept and identity formation are major tasks for each individual, and these tasks are by nature creative at a personal level, guidance counselors may

successfully accompany individuals by adopting creativity-oriented techniques to foster the exploration and construction of professional projects. This new connection between creativity and guidance counseling activities deserves to be explored further.

With the dramatic transformations in the organization of the labor market, the way individuals are pursuing and managing their career has changed. Consequently, at the beginning of the 21st century, an alternative paradigm in career counseling developed to meet the new needs (Savickas et al., 2009). Whereas the early theories were based on stable representations of both individuals and organizations with secure jobs, constructivist approaches focus on nonlinear dynamics. Also, contemporary career theories offer new understandings of self and the environment. This requires exploring more extensively one's narrative realities in order to facilitate the self-construction process. These authors have encouraged practitioners and researchers to elaborate innovative interventions to support clients' self-construction.

Creativity is a promising concept that offers the potential to build new career interventions that deal with uncertainty and complexity. We identified two challenging perspectives. The first is to develop creative career counseling techniques. Several methods have been already designed but little is known about their effectiveness [Heppner et al., 1994, unpublished; McMahon, 2016]. The second is to help individuals to develop creative resources in order to design their own trajectory that reflects their values and expressions (McMahon, 2016). Another alternative is to consider that career-related activities may enhance also adolescents' creativity (Au, 2015; Choi, 2014; Dollinger et al., 2005). Accordingly, further research is needed to understand the reciprocal relationship between creativity and career decision-making process.

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Further Reading

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The Creative Self in Dialogue

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The creative person has been, for a long time, at the center of creativity research in psychology. Whether in the form of a fascination for the genius and his or her hereditary attributes (Galton, 1874) or a more recent concern for mundane forms of creativity and their relation to personality (Barron & Harrington, 1981) and cognitive mechanisms (Finke, Ward, & Smith, 1992), creativity research has been and, to a great extent, continues to be individual-based (see also the discussion of the He and I paradigms in Glăveanu, 2010a). While it comes as no surprise that the person (including his or her "internal," psychological processes) represents a major point of interest for creativity scholars [as one of the main four P's in Rhodes' (1961) typology], the dangers associated with this narrow focus become obvious when creative people are studied separately from their context, particularly their social environment (Amabile, 1996). Besides leading, at best, to a partial view of what it means to create, this kind of acontextual research more or less implicitly contributes to the ideology of *individualism*, a powerful discourse that permeated the emergence and development of the psychology of creativity from the 1950s onwards in America (Guilford, 1950; Hanchett Hanson, 2015). Slater (1991) aptly captured the defining feature of this ideology when he noted that:

> The Individual versus Society—the rebel who stands alone against 'the system' and his neighbors—is one of the most popular themes in our culture. (…) The underlying dream in individualism is not merely freedom from oppressive authority, or freedom from arbitrary mechanical rules and senseless bureaucratic regulations; it is the dream of being able to act unilaterally throughout one's life—never having to deal with the maze of human relationships. Being able to be arbitrary, capricious, disconnected, all-powerful. *Slater (1991, pp. 152–153)*

And creative, we can add to Slater's list. Indeed, the theory and study of creativity in Western cultures and, nowadays, worldwide is historically

related to the "Individual versus Society" myth mentioned earlier. For a long time, the (truly) creative person was the one able to revolutionize society and fight the conformism of culture but from a position *outside* both society and culture. From the lone wolf to the creative maverick, this mentality that creativity comes from the "inside" and its test is precisely standing up to external forces is deeply rooted, at least in the Western world, and becomes part of what Slater (1991, p. 154) calls our "cultural conditioning." Paradoxically, the separation between the (creative) person and his/her sociocultural world—a silent premise for much past and present creativity research—is, itself, an expression of the sociocultural world we are trying to "escape."

In science, the cultural myth of the self-sufficient and clearly differentiated individual alimented the expansion of psychology as a discipline concerned with the study of *individual* mind and behavior. In the psychology of creativity, this disciplinary ethos became materialized in the compartmentalized study of different traits, processes, and functions within the person that contribute to creativity. Amabile's (1983) componential approach and Lubart's (2003) multivariate model exemplify the range of theories that specialize in differentiating and organizing intrapsychological "entities" involved in creative work. The list usually includes reference to several cognitive, affective, motivational, and personality elements, all seen as interacting with each other; indeed, plenty of efforts have been directed toward examining these interactions with the help of correlational or experimental designs. Important to note, most of the models in this category do postulate the role of the environment but simply as one element among many, usually coming to influence (enhance or constrain) this complex mental dynamic from the outside. The risk is that of inadvertently reifying intrapsychological processes. From dynamic tendencies and relational functions, coconstructed in the encounter between person and world, personality traits, mental states, and cognitive mechanisms are turned into "things" that gain enough distinctiveness and stability to be subjected to measurement. As a consequence of the aforementioned, the study of very specific intrapsychological traits and processes (e.g., divergent thinking, intelligence, openness to experience, intrinsic motivation, cognitive styles) ends up focusing our attention on each and every separate "branch" while missing the view of the "forest." When intensive research done on parts leads to dividing them further and further without a clear concern for reconstruction and integration, we miss an understanding of the whole system; in other words, we study parts and pieces while missing the actual person doing the creating (see also Gruber, 1998, for a counterproposal).

Faced with the cumulative dangers of individualism, internalism, reification, and compartmentalization in the psychology of creativity, one can only celebrate the return of the self as a growing field of inquiry (something

the present volume testifies to). First and foremost, considering the creative person in terms of the self can go a long way in overcoming individualistic tendencies. This is because *there is no self without others and without culture*. Foundational scholarship by Mead (1934) made this point clearly from almost a century ago; in Mead's words, the person becomes a self when he or she is capable of "taking the attitudes of other individuals toward himself within an organized setting of social relationships" (p. 225). The birth and development of the self cannot be separated from the social environment, a premise convergent with contemporary attempts aimed at rethinking the creative person as a creative actor (Glăveanu, 2013a), a sociocultural agent constituted by, embedded within, and creating through self–other relations. Second, and related to the previous point, the self can be understood only as a system that articulates both intra- and interpsychological elements, thus challenging purely internalist views and strict compartmentalizations. Last but not least, the self is a dynamic, synergetic system (Glăveanu, 2010b) and needs to be studied developmentally.

The present chapter starts from and develops the premises previously mentioned, in an exploration of the "creative" self. In doing so, it first considers briefly the historical roots of self research within sociocultural psychology with a particular focus on two distinct yet interrelated approaches: dialogism and pragmatism. Both of them advocate for a view of the self as multiple and relational and this understanding is used to illuminate creativity as the process enabled by and, in turn, enabling the multiplicity of the human self. A theoretical model grounded in the notions of positions, perspectives, and dialogues of and within the self is discussed and illustrated. This model is then applied to contemporary research on creative identity, creative self-efficacy, and creative mindsets in an effort to further "socialize" these lines of study. Finally, the chapter ends with a few notes regarding the importance of metacognition and reflexivity for the study of creative selves in society and culture.

TWO SOCIOCULTURAL APPROACHES: ONE MULTIPLE SELF

There are many perspectives one can take on the self, from developmental (Erikson, 1968) and cognitive (Klein & Loftus, 1990) to neurological (Pfeifer, Lieberman, & Dapretto, 2007); equally, there are many aspects of the self that one can think about, for example, awareness, perception, identity, esteem, concept, schema, beliefs, and regulation. Despite this diversity, there is one main theoretical position from which the study of the self emerged in psychology, and that is the sociocultural one. Sociocultural understandings of the self often draw on the seminal work of James (1890) and his basic idea that the self is, in fact, multiple and that we have as

many selves as other people and groups we interact with. His dynamic relation between the I and the Me, the self as knower and the self as known, respectively, opened the door to diversity and differentiation within the traditionally singular, distinctive, and unitary "I" (the Cartesian self; see Hermans, 2002, 2003). More than this, James' legacy also points us to the fact that others are at the root of the multiplicity of the self, as the self is largely constituted by interactions with others that become internalized over time. The core premise of sociocultural theories of the self is therefore the following—*by living within societies characterized by a diversity of social positions, "occupied" by other people and groups, individual selves become multiple, in the sense that they are forged by the dialogue between these positions and their associated voices and perspectives*.

In making this general claim, three observations are required. First, adopting a sociocultural stance does not mean "dissolving" the self in dialogues and interactions with others, making it open to radical change from one day to the next, depending on social context. The multiple self is neither completely fluid nor schizophrenic. Its development is marked by the gradual encounter with others and the *accumulation* of positions and perspectives that give the self continuity over time. Moreover, the social environment we grow into and inhabit presents us with relatively stable conditions of living where distinctive social others and groups consistently participate in our external and internal dialogues. Second, the multiple self is not a deterministic one. It does not imply that who we are as individuals is completely dependent on who we interact with. Because of our accumulated personal histories of social relations and, above all, our continuous reflection regarding these relations, we are capable of developing a sense of agency in selecting, shaping, and ultimately opposing the "influence" of others. Importantly though, this is not the "individual versus society" logic Slater (1991) was critical of; in sociocultural theory the relation between person and society is one of mutual dependence and, as such, the individual can indeed, at times, oppose (the voices or perspectives of) society, but always *from within it*. Third, the continuous and bidirectional relations established between self and other lead to a seemingly paradoxical characteristic of the human self—that it is, at once, *personal and shared, unique and collective*. No two identical selves exist because of different socialization contexts; at the same time, no self is an isolated island, removed from the bonds that connect it with others and culture. To take the example of language, we use it to express ourselves in unique ways and yet, to do so, we must share a grammar, a vocabulary, and a world of cultural meanings.

Despite this distinctive epistemological basis, we cannot rightfully talk today about a single sociocultural theory in psychology, including the psychology of the self. In this section, I briefly review two historical approaches to the multiple self that are particularly fruitful, in my view, for theorizing the creative self, a topic I turn to in the next section.

Dialogism and the Dialogical Self

Dialogism, itself a heterogeneous theoretical construct that spans authors and disciplines (see Linell, 2003; Marková, 2006), essentially postulates the interactive and relational nature of mind, self, and society. Rooted in history and philosophy (see the concept of dialectics), dialogism in psychology often draws on the scholarship of Russian philosopher and literary critic Bakhtin who, together with other collaborators from the Bakhtin Circle, made important contribution to our understanding of language and speech. For him:

> Every utterance must be regarded as primarily a *response* to preceding utterances of the given sphere (…). Each utterance refutes affirms, supplements, and relies upon the others, presupposes them to be known, and somehow takes them into account (…). Therefore, each kind of utterance is filled with various kinds of responsive reactions to other utterances of the given sphere of speech communication. *Bakhtin (1986, p. 91)*

The previous passage vividly illustrates Bakhtin's idea that the use of language is not only social because it takes place, primarily, within a social relation defined by communication, but also because even the most personal acts of speaking (including to oneself) involve an audience and reflect a longer social history. His notions of language as *heteroglot* (involving the speech of others) and *polyphonic* (incorporating multiple voices) became fundamental for much more than literary theory and semiotics. Indeed, they helped transform our understanding of mind as a dialogical phenomenon. Marková (2003, p. 85) defined dialogicality as "the capacity of the human mind to conceive, create, and communicate about realities in terms of the Alter." In other words, the multiplicity of self–other (or Ego–Alter, I–Thou) relations is placed at the core of all our psychological processes, from remembering and thinking to imagining and, as we will see later on, creating. This ontological position challenges internalist assumptions about the self as well. Living in a world of others, our selves are not contained within the border of the skin, in Cartesian terms, but extended into the world of self–other, self–group, and self–society relations (Marková, Linell, Grossen, & Salazar Orvig, 2007). Most of all, this perspective makes us sensitive to the existence of "inner others" (Marková, 2006) or "the-other-within-the-self" (Salgado & Ferreira, 2004) as key positions within internal dialogues.

On this theoretical basis, the Dialogical Self Theory (DST) formulated by Hermans and collaborators (Hermans, 2003; Hermans & Hermans Konopka, 2010; Hermans & Gieser, 2011) conceptualizes the self as a "dynamic multiplicity of voiced positions in the landscape of the mind, intertwined as this mind is with the minds of other people" (Hermans, 2003, p. 90). According to DST, the self is spatially structured and embodied, populated by the voices of others, decentralized and open,

and contextualized by culture. Borrowing from James the basic idea of the self as continuous yet multiple, and from Bakhtin the idea of the self as internally differentiated as voices in dialogue, DST focuses on the study of I-positions within the self (i.e., I as parent, I as child, I as music fan, etc.). Importantly, "the I fluctuates among different and even opposed positions, and has the capacity imaginatively to endow each position with a voice so that dialogical relations between positions can be established" (Hermans, 2002, p. 148). The analysis of positions, voices, and dialogues is thus specific for the dialogical study of multivoicedness within the self (see Aveling, Gillespie, & Cornish, 2015).

Pragmatism and the Perspectival Self

A complementary approach to the dialogical self finds its historical roots in American pragmatism, particularly the works of James, Peirce, Dewey, and Mead (see Wiley, 2006). The latter is particularly credited for offering a comprehensive theory of the development of the self based on perspective-taking and reflexivity (see Mead, 1934; Gillespie & Mead, 2005); more than this, and perhaps less known, is that Mead also built "a philosophical approach to the objective reality of perspectives that is essential to a full appreciation of the nature and impact of his work on interpersonal interactivity and self development within the social process" (Martin, 2005a, p. 232). The pragmatic, perspectival psychology of personhood Martin (2012) elaborated based on Mead's work starts from the practical activities of people and their embodied interaction with objects and other people in a world of culture and institutions. It is the study of the constant and dynamic coordination between person and world that defines the self and this coordination cannot be understood outside a close examination of positions occupied by self and others and the perspectives they generate.

The multiple self according to this orientation is essentially a perspectival one. To understand it, we need to consider first the positions we adopt, both physically and symbolically, across the life course, as well as in moment-to-moment interactions with others. These positions are often complementary in nature, for example, parent–child, student–teacher, seller–buyer, and doctor–patient. They are experienced by the self not only because of direct interactions but also because we are capable, from an early age, of taking the perspective of someone who is a parent and someone who is a child, of a doctor and a patient, etc., for instance, in children's play (Russ, 2013). The construction of these perspectives is not only scaffolded by actual interactions with other people but makes use as well of cultural resources, such as norms, traditions, and language. With their help, we become capable of not only understanding different positions than our own but also moving between them, something discussed at length by Position Exchange Theory (PET) (see Gillespie & Martin, 2014).

The accumulation of position exchanges, in both physical and symbolic terms, is postulated as the basis of dialogicality and contributes to the development of a multiple, relational self.

In sum, the pragmatist theory of the self can be qualified as perspectival (see Martin, 2005b), where perspectives are bound to certain positions and "may be understood broadly as perceptual and conceptual orientations to a situation with a view to acting within that situation" (p. 231). The self develops, in this view, through the appropriation and interrelation between various perspectives, from those of other people to those of society itself (what Mead referred to as the "generalized other"). To continue the examples given earlier, being capable of adopting the perspective of a seller and a buyer and, most of all, to articulate them, makes us able to function within society in contexts, such as shopping in supermarkets or eating at the restaurant. Important to note, all social situations we traverse throughout our existence involve different (usually binary) positions and, as a consequence, invite a multitude of perspectives; as such, they also require selves that can "become" others in order to understand themselves and the surrounding world, and to coordinate their activity within it.

In conclusion, sociocultural accounts of the self, such as the dialogical approach and perspectival approach have a lot in common. To begin with, both of them start from considering the correspondence between positions "external" and "internal" to the self and the possibility of "moving" between them. They differ, however, in what they see as deriving from these positions: voices in the dialogical tradition and perspectives in the pragmatist one. Finally, both of them argue for the importance of putting voices or perspectives, respectively, in dialogue with each other. Most of all, and important for the argument here, the two approaches consider the interweaving of internal and external dialogues as the basis for our capacity to take distance from our immediate context and position within it and understand both in terms of other positions and contexts. This capacity is placed at the root of agency (Gillespie, 2012) and, as I will argue next, of creativity itself. As will be shown in the following section, a dialogical/perspectival self is not only endowed with the possibility to create but also defined by this very possibility; in this sense, *the human self is, at once, a creative self and a self in dialogue*.

INNER DIALOGUES, CREATIVITY, AND THE SELF

Language exists only when it is listened to, as well as spoken. The hearer is an indispensable partner. The work of art is complete only as it works in the experience of others than the one who created it. Thus language involves what logicians call a triadic relation. There is the speaker, the thing said, and the one spoken to. The external object, the product of art, is the connecting link between artist and audience. Even when the artist works in solitude, all three terms are present. The work is there in progress,

and the artist has to become vicariously the receiving audience. He can speak only as his work appeals to him as one spoken to through what he perceived. He observes and understands as a third person might note and interpret. *Dewey (1934, pp. 110–111)*

Dewey's observation makes the perfect link between dialogism and language, art, and the multiple self. What he observed in the creative activity of painters is precisely the fact that creativity requires more than the relation between creator and work, or person and product in Rhodes' (1961) typology: it always involves an other position or, more explicitly, the position of an other. This other is the audience, from particular people (clients, curators, etc.) the artist might have in mind to a more diffuse sense of the general public (embodying the social reception of art). In previous work (Glăveanu, 2013a), I have discussed the various roles played by other people—the audience—in relation to creativity: from collaboration and cocreation to the social validation of creativity. In view of our discussion of the self, what is important to notice is that creative actors are not only related to "external" audiences with whom they are in direct or mediated contact but also related to internalized audiences that constitute their self as multiple; moreover, these external and internal audience positions and the self–other dialogues they enable are *mutually dependent*.

What I focus on in this section is the relation between the self and creativity, the latter broadly defined as a dialogue between different, sometimes unexpected or even opposed perspectives, leading to the generation of new ideas, insights, and ways of acting that are meaningful and potentially useful. This simple definition forms the basis of a recently proposed perspectival model of creativity (see Glăveanu, 2015, 2016), which postulates that:

1. In any given situation there are a multitude of perspectives that can be adopted toward the same reality (object, person, event, etc.). (…)

2. The perspectives adopted have interactive, embodied origins as they are grounded in different positions in the social and material world. (…)

3. Formulating and taking new perspectives involves adopting positions of 'others' in relation to the situation. (…)

4. Moving between perspectives makes the difference between positions productive for creative action. *Glăveanu (2015, pp. 170–172)*

This model draws, in obvious ways, on both dialogism and perspectivism by placing position exchanges and dialogues between perspectives at the core of creative activity. Intended as a sociocultural model of the creative process, it is nevertheless relevant for our understanding of the creative self as a self that moves between different positions and perspectives and, most of all, a self that reflects on the significance of this difference between

positions and perspectives (see Glăveanu & Gillespie, 2015). Applying the perspectival model goes, in this sense, far beyond an analysis of collaborative creative action and focuses our attention on the range of "internal" dialogues taking place within the creative self. Before proposing a small typology of such dialogues and their role in creative expression, a final note is required on the relation between perspectives and voices. In my own theorizing about creativity, I prefer to use the notion of perspectives as they relate persons (or, rather, certain positions) and world (the thing, idea, person, event, or phenomenon the perspective is "about") always in reference to other perspectives (thus, other positions from which the "object" is being constructed). In contrast, voices in dialogical theory refer primarily to the dialogue between person (position) and audience (position), and only secondary to the "object" of the dialogue itself. This means that, while there is considerable overlap between the meaning of voices and perspectives, the former is fruitfully applied, in my view, to a wider range of creative actions taking place in the triadic relation between self, other, and world.

Dialogue Between I-Positions

One of the first and most obvious types of inner dialogues takes place between different I-positions, to use the terminology of the dialogical self. Using PET we can think about these positions in a highly flexible manner, as defined in institutional terms (e.g., doctor, president), in social terms (e.g., buyer, learner), in interactional terms (e.g., observer, speaker), or a combination of these. Positions can be found in society but also constitute what Hermans (2002) aptly called "a society of the mind"—they become therefore I-positions from which we can think of and act in the world. While some I-positions are central for our self and give it continuity (e.g., the I-position of being the son or daughter or someone, of being a student for a certain period of time), others are more peripheral to the self and adapt it to changing circumstances (e.g., one can have internalized the experience of being a victim or someone being made fun of without these becoming typical I-positions for the self). More than this, at every moment we have an array of I-positions from which we can understand and act within a given situation. The perspectives on the situation specific for these I-positions may be convergent or divergent, may support or complement each other, or be in conflict. The range of these perspectives and the possibility to move between them in ways that either integrate or differentiate them further are essential conditions for creativity.

The dialogue between different I-positions within the self allows the person to take distance from singular, dominant views of the world and helps him/her mobilize personal experiences or other experiences of the social world in order to relate more flexibly to the situation at hand. For

example, brainstorming ideas about how to improve a toy (a common diverging thinking task) is potentially more fruitful for those people who can actualize I-positions relevant for this task, for example, parents of young children, fans of cartoons, or avid game players. Conversely, rigidity in building perspectives from other positions than the one required by the situation might very well constrain one's creative action; think, for instance, about a teacher engaged in educational practice primarily from this position, without putting in dialogue other potential I-position, such as former student, child, or parent. At times, the self is "pushed" into adopting new I-positions by the situation itself or by a new physical or material arrangement. For example, painters regularly move between a position of immersion within their work, while applying color on the canvas and seeing it from up close, and a position of detachment when they take a step back and consider the effects of what has been done (see Glăveanu, 2015). This move between the I-positions of maker and evaluator and the dialogue between their resulting perspectives can make the difference between success and failure in art.

Dialogue With Inner Others

Aveling et al. (2015), following Marková (2006), distinguish between dialogues between I-positions (or what they call "voices of the self") and dialogues with inner others (or "voices of others within the self"). The latter can be further differentiated between more or less specific "others" and a more generalized "Other," represented by society and culture as a generic audience. In this subsection I refer only to others (without a capital O), people we interact with and whose perspectives become familiar to us but whose positions remain explicitly those of others. And yet, just as in the case of I-positions, inner others and their perspectives do "populate" the life of the self. How can we detect their voices or perspectives? Aveling, Gillespie, and Cornish propose the following:

> Voices of inner-Others may appear within the talk of the Self in at least three forms (Gillespie, 2006): in the form of direct quotes, where the speaker gives voice to a specific person or group (e.g., 'my mother said xyz'); in the form of indirect quotes, where the speaker refers to the opinions, beliefs, utterances or ideas of another person or group (e.g., 'they believe that people should xyz'); and in the form of 'echoes'. Echoes pertain to a more subtle level of dialogicality, namely, the way in which most ideas and utterances are second-hand or borrowed. (…). For example, a student might struggle to speak through a newly appropriated academic discourse. In such a case the attentive listener will hear 'echoes' of textbooks, teachers and perhaps other students. Echoes, then, are akin to unreferenced quotations. *Aveling et al. (2015, p. 673)*

Creative work builds on all these types of dialogues. A study of creativity in five different domains (see Glăveanu & Lubart, 2014) revealed, for instance, a complex network of other people whose voices creators

regularly engage with in performing their activity, from clients and funders to peers, friends, and family members. One of the artists in this study, for example, discussed at length her collaborative relation with her partner, a nonartist. This relation was considered fundamental for getting new inspiration, for defining a creative vision, and for questioning her own understanding of art. In presenting such close relationships, respondents often used both direct and indirect quotes and, arguably, a more in-depth dialogical analysis could also reveal the echoes carried by the perspectives of others into creative work. The artist in question, for example, acknowledged such echoes in talking about the "common interests," "shared values," and "combined sensibilities" that nurture her artistic practice. However, it was not only convergence but especially conflict between her view and that of her partner that was considered especially productive, another reminder of the importance of being open to and cultivating difference within and around the self.

Dialogue With the Generalized Other

Last but not least, a third important type of inner dialogues is established with a more abstract and yet no less "real" type of audience— collective others. I am using Mead's notion of the generalized Other (capitalized here in order to differentiate it from specific others) to refer to "a societal 'super-addressee' sanctioning and reprimanding individuals who dissent from socially imposed norms" (Marková, 2006, p. 135). What "people" say, believe, or do remains a powerful standard for the self, one inscribed from early on in children's play whenever they appeal to the rules of the game or complain that "it is not done like this." The position from which such remarks are made moves developmentally from one of the self (because I want it so) or of others (because my mother said so) to, finally, one of the superaddressee mentioned by Marková (because this is how things should be). Norms and conventions are perspectives that emerge from this superaddressee or generalized Other position and they have an important part to play in creativity.

Oftentimes this role is simplified as essentially negative: creators miss many opportunities to do things differently because their thinking becomes conventionalized by society or, using our terminology here, because they submit to the generalized Other. However, what we fail to see in these cases is the importance of conventions for establishing precisely the space of the possible without which there would be no creative action (for nothing else, because the novel can be recognized only in relation to the conventional). The role of conventions and norms for creativity is evident not only in Eastern approaches to this phenomenon (Leung, Au, & Leung, 2004; Niu & Sternberg, 2006) but also in the study of everyday creative activities, such as craftwork. Take, for example, the

practice of Easter egg decoration, an artistic craft that enjoys a long tradition in Romanian rural communities (see Glăveanu, 2013b). Creativity in this folk art, like in many others, relates to the constant combination and recombination of existing elements, often with surprising consequences. What is important for artisans, however, is not to "break," in their work, established rules of the tradition; otherwise their decorated eggs would become "meaningless" (as they say, they would "be something else but not Easter eggs"). Craftsmen internalized, during many years of practice, what tradition is and how traditional eggs are expected to look like. While working, they pay close attention to how much they transform tradition in what can be conceptualized as an inner dialogue with the generalized Other—the craft and its many keepers within the local community. Is egg decoration less creative because of this dialogue? I argue this is not the case for two reasons. First, tradition itself is not unitary but multifaceted, even within one and the same community. This offers artisans the opportunity to negotiate what aspects of the tradition they keep in their work and what aspects they "renew." Second, and most important, dialogues with the generalized Other take place in the context of multiple other dialogues with inner others (e.g., fellow artisans, customers, ethnographers) and I-position (e.g., maker, seller, community member). This complexity makes creators aware of hegemonic perspectives on their work while giving them the resources necessary to adapt (to) them from positions of the self, of others, and of society.

NEW AVENUES FOR CREATIVITY AND SELF RESEARCH

A sociocultural analysis of the creative self, as argued earlier, focuses our attention on the inner dialogues of the self (in their relation to external dialogues) while creating. In contrast, traditional research on the self and creativity, usually situated at the intersection between social cognition and individual differences, focuses on the person's beliefs and evaluations about creativity either in general or in specific types of activity. We therefore have here a substantial difference in approach: from relatively stable systems of beliefs to dynamic dialogues of voices or perspectives within the self, from cross-sectional measurements of self attributes to a longitudinal concern for the interplay between self and others in creative action. However, despite this difference (or rather, because of it), I argue in this section that there is great scope for cross-fertilization between theoretical approaches and for opening up new avenues for research based on rethinking old and new concepts—for example, creative identity, creative self-efficacy, or creative mindsets—from a sociocultural standpoint.

Let us start from the most general notion of *creative self-concept*, defined by Karwowski (2015a) as a multifaceted construct covering aspects related to the creative self-concept, creative personal identity, self-rated creativity, and creative metacognition (CMC). This cluster of beliefs and assessments, the author shows, develops gradually during the first decade of one's life and changes as the person transitions to adulthood. If we were to consider this construct through sociocultural lenses, we would probably refer to different "concepts" of the creative self the person "acquires" in the life course by interacting with multiple others (from family and friends to fellow students and coworkers). These concepts (or conceptions) are what Bakhtin and Hermens refer to as voices within the self or what Mead, Martin, and Gillespie would call perspectives. These voices or perspectives are relational—they connect different I-positions, inner and outer others, and make reference to generalized Other/societal discourses about creativity—and their "object" is the creative self. The outcome of their dialogue is a situated and heterogeneous *creative (or noncreative) identity* that develops through ongoing interactions with other people. The making and transformation of this identity do not concern therefore only the person, but reflect the relation between the person's perspective on creativity and the perspectives of others, including the generalized Other; this relation can be largely supportive for developing a creative self identity, oppose it, or become problematic and tense because of contradictory demands on the person (see Glăveanu & Tanggaard, 2014). In any case, the study of this complexity cannot be reduced to the use of questionnaires about one's creative self-concept since numerical values obscure rather than illuminate inner dialogues that are at the core of the phenomenon being studied (also Rosenbaum & Valsiner, 2011). A "creative" methodological solution in this regard might be, time permitting, to use scale items as open interview questions and, following this, subject the answers to a dialogical type of analysis (see Aveling et al., 2015).

A particular topic within the creative self-concept that received, by comparison, considerable attention in creativity research in the past decade is *creative self-efficacy*. Broadly defined as self-judgments about one's ability to generate novel and useful outcomes (Beghetto, 2006), creative self-efficacy is believed to influence, at least in part, creative performance. Most importantly though, judgments about one's creative efficacy relate, predictably, to the view of other people and the feedback received from them (see Beghetto, 2006; Beghetto, Kaufman, & Baxter, 2011; Karwowski, Gralewski, & Szumski, 2015) and also the mere presence of creative peers can strengthen an individual's creative self-concept (Karwowski, 2015b). These findings offer further support for a sociocultural analysis focused on the number and nature of exchanges between students, a usual population for this research, and other people regarding creative performance. This analysis should, however, go beyond classic student–teacher interactions

and extend the research focus, as much as possible, to other significant or immediate others, such as parents, friends, and peers. This kind of study becomes even more important when discrepancies are found between student and teacher judgments of creativity (Beghetto et al., 2011). Although correlates between creative self-efficacy and other internal attributes, such as personality traits (Karwowski, Lebuda, Wisniewska, & Gralewski, 2013) or curiosity (Karwowski, 2012) are interesting in their own right, more research is needed on the relation between creative self-efficacy, social interactions, and cultural context in a longitudinal view (e.g., of current research, see Karwowski, 2015b; Karwowski & Barbot, 2016; Karwowski et al., 2015). Tierney and Farmer's (2011) considered, in this respect, the development of creative self-efficacy and creative performance over time in an organizational context. Including other domains of activity and comparing them would be a useful addition in future research.

Last but not least, *creative mindsets* emerged recently as a new area of study within the field of creativity and the self. Karwowski (2014) reported on an ample program of research exploring the structure, correlates, and consequences of creative mindsets. The author defines mindsets as "beliefs about the stable-versus-malleable character and the nature of creativity" (p. 62). His findings point to the fact that the stable and malleable mindset about creativity should not be conceptualized as two ends of one continuum that exclude each other; rather, they are relatively independent, even if negatively correlated, constructs. From a sociocultural standpoint this finding makes perfect sense considering the fact that, as suggested before, beliefs about the self and one's abilities are conceptualized not as stable and autonomous mental structures but dynamic voices or perspectives in dialogue with each other and the social world, including culture (Tang, Werner, & Karwowski, 2016). The first sociocultural question that comes to mind concerning mindsets is the following: what are the positions from which the perspectives of creativity as a fixed or as a malleable quality are being constructed? Which voices within the self argue for one mindset or the other and what kind of dialogues with other positions and voices do they engender? A second area of concern would be for the role of context in the dialogue between fixed and malleable perspectives. Karwowski (2014) found that people prefer a malleable over fixed mindset—in which situations would the same people go against their preference? In other words, what contextual factors contribute to a change in perspective and why?

In conclusion, issues related to identity, self-concept, self-efficacy, and mindsets are all important, including from the standpoint of sociocultural psychology. What this discipline proposes is the study of dialogues between perspectives concerning creativity and self, dialogues that are both situational and developmental; this is thus a call for more ecological and qualitative research to complement, when suitable, the traditional use of scales. While the situational aspect needs no further explanation—as

it brings us back to the focus on the specificity and uniqueness of self—other relations developed "within" and "outside" the self—a final note is required regarding the developmental part. Martin (2014, 2016) recently developed and illustrated, including case studies of creative people, a specific type of method called *Life Positioning Analysis* (LPA). This method is based on PET (explained in the section "Pragmatism and the Perspectival Self") and, more generally, on a pragmatist conception of personhood developed through embodied and situated participation in social interactions throughout the life course. The five phases of this kind of research include the following:

1. an identification of particular, influential others (highly significant others with whom a focal person has interacted, exchanged, and coordinated positions and perspectives) and relevant generalized others (broader social, cultural traditions, practices, and perspectives that form a background of assumptions, understandings, and ways of relating and living) within the life experience of the focal person;
2. an analysis of positions and perspectives occupied and exchanged with particular and generalized others within different phases of the person's life;
3. a thematic analysis of positioned experiences and perspectives across the different phases of the person's life;
4. an analysis of the manner and kind of integrations the person has achieved across the different positions and perspectives that have defined her or his life experience, with an emphasis on processes of distantiation, intersubjectivity, and identification;
5. the construction of a life positioning summary that attempts to depict the person's embeddedness within the positions and perspectives of the overall life experience (Martin, 2014, pp. 5–6).

I would argue, together with Martin, that such a careful study of dialogicality could greatly benefit creativity research, in particular research on the creative self. Its main contribution, more generally, is to challenge traditional studies of the creative person in terms of "components" (i.e., personality traits, intelligence, and so on) and replace it with a holistic and developmental account of creative actors specific for sociocultural theories.

FINAL NOTE ON REFLEXIVITY, POWER, AND ETHICS

The perspectival model of creativity (Glăveanu, 2015) places perspective-taking and reflexivity at the core of the creative process. Applied to the creative self, this sociocultural model encourages us to study not only the positions and perspectives that constitute it but also the relation between them, conceptualized here as dialogues. What these relations imply

ultimately is the capacity of our multiple self to hold, simultaneously, different if not contradicting perspectives on reality; moreover, they imply the capacity to reflect on this difference. Reflexivity as a core process in the construction of self (Mead, 1934) and creative action (de Saint-Laurent & Glăveanu, 2016) requires further theoretical elaboration and research attention, especially since it links well with very recent concerns in the creativity literature for metacognitive abilities and creativity. In particular, Kaufman and Beghetto (2013; also Beghetto & Karwowski, this volume) proposed the notion of CMC to account for both self-knowledge in relation to creativity and context knowledge (knowing when, where, how, and why to be creative). CMC connects thus to a sociocultural focus on reflexivity (addressing the how and why of creativity) as an articulation of perspectives (self-knowledge) and positions (the when and where of context). Future studies in this area could bring together cognitive and sociocultural theories through a focus on CMC as a reflective process.

A final reflection on the relation between theory and practice is also called for. Even if this theoretical orientation *socializes* self research by postulating the coconstitutive nature of "internal" and "external" dialogues in the making of the creative mind, it still requires *critical social theory* to unpack the implications of these dialogues. For instance, Aveling et al. (2015) rightfully point to the fact that external and internal dialogues never take place on a neutral, level playing field. "Reflecting the sociocultural context from which the voices within the Self originate, the dialogical dynamics within the Self are characterized by patterns of dominance and asymmetrical power relations" (p. 674). What are the relations of power established when the self considers creativity and judges personal creative actions and potential? What positions and perspectives dominate over others and why? What is the developmental history of internalizing dominant views and how does it relate to the history of the society we live in? Last but not least, how can we cultivate plurality of perspectives and reflexivity about the meaning and value of creativity for both self and others? Mead believed that "the moral worth of a society can be judged in terms of the degree to which members and institutions in the society are able to adopt multiple perspectives" (Martin, 2005a, p. 250); we can easily extend this argument to the self. In doing so, we necessarily add ethics to our concern for self–other dialogues and creativity, an important issue when the aim is not only to build good theories but also to inform good practices.

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Me, Myself, I, and Creativity: Self-Concepts of Eminent Creators

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> The shaping of a creative life is not an a priori gift but a process of self-construction.
> *Gruber and Bödeker (2005, p. 397)*

One's profession—the type of occupational tasks, work performance, and the social interactions it entails, as well as the image and prestige of the profession and the role it plays in relation to other activities—shapes one's self-image and the beliefs about one's abilities (Glaeser, 2000). It is known that creative work is associated with a specific lifestyle and outlook on life (Dollinger, Dollinger, & Centeno, 2005). A considerable amount of attention has been paid in the past decade to creativity in self-description (creative personal identity—Jaussi, Randel, & Dionne, 2007; Tierney & Farmer, 2002) and in one's professional role (creative role identity—Farmer, Tierney, & Kung-McIntyre, 2003), as well as to assessing one's efficacy in taking on tasks that require creativity (creative self-efficacy—Beghetto, Kaufman, & Baxter, 2011; Karwowski, 2011; Tierney & Farmer, 2002). However, as yet, little is known about the specificity of creative self-concepts and creative self-beliefs (Karwowski & Barbot, 2016; Karwowski & Lebuda, 2017) in people dealing with creativity professionally (Pro-c creativity) and those whose work has gained public recognition (Big-C creativity) (Kaufman & Beghetto, 2009). We believe that an analysis of these topics provides an opportunity to improve our understanding of the principles governing the realization of creative potential, as well as initiating and pursuing creative activity. We, therefore have decided to

undertake a synthesis of previous research and reflection on this topic and to present the results of analyses of data from two independent studies focused on the issue: interviews conducted by Csikszentmihalyi (1996, pp. 390–391; *N* = 92) and interviews with contemporary eminent Polish artists and scientists (*N* = 34) (see Lebuda, 2014; Lebuda & Csikszentmihalyi, submitted for publication).

In this chapter we focus on two issues: the specificity of self-concepts of eminent creators, especially their identity in the professional role of a creator, and the key experiences in the process of developing a creative self-concept.

THE SPECIFICITY OF A CREATOR'S SELF-CONCEPT

What sets eminent (Big-C) creators apart from other professionals (Pro-c: creative but not eminent) is a more positive creative self-concept (e.g., Albert & Runco, 1986; Barron, 1983; Barron & Harrington, 1981; Dowd & Pinheiro, 2013; Feist, 2014; MacKinnon, 1978, 1983; Ochse, 1990; Stein, 1974; Taylor & Barron, 1963; Zuckerman, 2005), high self-confidence, self-control, self-monitoring, self-esteem, self-efficacy, and self-reinforcement (Cox, 1926; Dacey, Lennon, & Fiore, 1998; Kozbelt, 2007; Pesut, 1990; Wolpert & Richards, 1997). In their self-descriptions they mention traits related to creativity, such as independence in their professional role (e.g., MacKinnon, 1978, 1983; also see Dudek & Hall, 1991). They rate their own creative ability as high—this refers to their ability to think unconventionally and solve problems in original ways (Barron, 1983). A positive self-concept is of particular significance to creative achievement in women: female artists and scholars who have achieved professional success score much higher on self-confidence than other women (Bachtoldl & Werner, 1972; Csikszentmihalyi, 1996; Mockros & Csikszentmihalyi, 1999).

What binds all the elements of self-concept together and gives them meaning is identity (Hogg, 2003; Tajfel & Turner, 2004). A coherent identity is sometimes considered as a creative achievement (Dollinger & Clancy Dollinger, 2017). It is of key importance to the realization of creative potential: to translating it into achievement (Dollinger et al., 2005; Helson, 1967; Helson & Pals, 2000; Szen-Ziemiańska, Lebuda, & Karwowski, in press); it helps focus on goals and persevere despite failure, thus increasing the odds of success in a given domain (Cox, 1926; Freeman, 1993). Identity plays an important role in coping with challenges arising not only from the very nature of creative work but also from the way the creative market, especially the artistic market, operates (i.e., from the fact that it does not provide reliable income), which entails feelings of uncertainty (Bridgstock, 2005, 2011, 2013; Inkson, 2006; Zwaan, ter Bogt, & Raaijmakers, 2010).

Creativity has been viewed as crucial for identity formation (Barbot & Lubart, 2012; Berman, Schwartz, Kurtines, & Berman, 2001; Dollinger et al., 2005), and creative activity, especially artistic in nature, is considered an expression of self, a result of a search for identity, and an attempt to unify it (Albert, 1990). It is a source of confirmation of the self in the role of a creator (Helson & Pals, 2000; Petkus, 1996). One of the interviewees, poet Mark Strand, stated: "I think that it's inevitable, you learn more about yourself the more you write, but that's not the purpose of writing" (Csikszentmihalyi, 1996, p. 241).

However, there are some challenges for creators' identity formation: the lack of a unified and commonly accepted definition of the professional role of a creator (Bain, 2005; Glăveanu, 2010) and no clear-cut distinction between being an amateur and a professional (Frith, 2001)—especially in the case of artistic activities in which little or no specialist training is required (Toynbee, 2000).

What is interesting, in attempts to define who a creator specifically is, is that identity is one of the central elements of the definition. The United Nations Educational, Scientific, and Cultural Organization's (UNESCO) International Art Association defines a creator as:

> any person who creates, or gives creative expression to, or re-creates works of art; who **considers his/her artistic creation to be an essential part of his/her life**[a]; who contributes to the development of art culture; and who asks to be recognized as an artist, whether he/she is bound by any relations of employment or association. *Burgoyne (1990, p. 29)*

The definitions apply to artistic rather than to scientific or performing domains, but it seems relevant also to those areas. What was pointed out as crucial for being a creator was engaging in a creative activity, considering it a significant part of one's life, and operating within a creative system, which means interacting with others active in a given domain (Freeman, 1993; Helson, 1990; Lena & Lindemann, 2014), as well as being recognized by peers (see Csikszentmihalyi, 1996). Thus, a more precise definition of the role of a creator (Fendrich, 2005) goes beyond the person's faculties; what is also important is sharing the public perception of a creator (Bain, 2005; Hagstrom, 2005; also noted in Glăveanu & Tanggaard, 2014). Such a juxtaposition of one's role with the expectations of others may lead to a certain dissonance referred to as "identity ambivalence" (Davis, 1994; Lloyd, 2010). This is illustrated by research on the sociocultural model of creative identity (Glăveanu & Tanggaard, 2014), in which three types of creative identity have been described: promoted, denied, and problematic. In each of them, identity is a result of negotiation between the person engaging in creative activity and the social conceptualization of the role of

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[a]Authors' emphasis.

the creator—"Identity is a project coconstructed by self and multiple others" (Glăveanu & Tanggaard, 2014).

For this reason, we read the interviews with established, eminent artists and scientists (Csikszentmihalyi, 1996; Lebuda, 2014; Lebuda & Csikszentmihalyi, submitted for publication) in search of information indicating what it meant to the interviewees to be a creator (see Freeman, 1993) and what their career (occupational, vocational) self-concepts were characterized by (Luyckx, Goossens, & Soenens, 2006; Skorikov & Vondracek, 2007). As a result of the analyses, we identified five coherent, mostly nonoverlapping, types of views of the creator's role (Lebuda & Csikszentmihalyi, submitted for publication). According to the first type of view, creative work is a commitment to fulfill one's potential. The ability is seen as a gift and the realization thereof as a person's destiny, even if it requires many sacrifices. This is how a respondent who shared such convictions spoke about engaging in creative work:

> … there is no private life, hobbies, or entertainment. I do not want to be distracted, now is the time for me to fully focus on this project. I feel that I can finally show my whole potential. Also, my private life is a creative life. *Visual art, film, new media; male*

Eminent creators representing the second type perceive creative work as a social obligation. The creator's role in this case is to apply his or her abilities for the good of the community, to "change the world for the better." This view is associated with a clear sense of responsibility for creation, perceptible in the following words:

> I always have to think three times, I cannot say what I want, because people take my word as sacred sometimes. Before any such meeting I prepare and weigh every word. It may seem funny, but then I can change someone's life and it is an unimaginable responsibility. *Film; male*

Some creators, representing the third type, see their work as an integral part of life. To them, being a creator is central to personal identity; it occupies a key place in their self-concept and lifestyle. Creators who view their role in this way tend to define themselves in terms of their occupation in all situations in life. This is how a contemporary Polish writer put it:

> I am a creator, in the same way when I write and when I go for a walk; I overhear passers-by, look around, and even when I read the news I see themes and ideas everywhere. Sometimes I do it on purpose, but sometimes it just happens. You cannot be a creator halfheartedly. You cannot, like in a bank for example, go ding! 5:00 pm, go out and call it a day. Writing is a completely different job, it's more about being a person of a certain sensitivity and skill. *Literature; male*

What comes to the foreground in the remaining two views of the creator's role, exemplified later, is the idea that being a creator is a matter

of decision (see Sternberg, 2002)—a choice which nonetheless entails particular demands, especially with respect to the balance between the professional and the private. Interviewees representing the fourth type, who considered creative work a demanding profession, indicated that this type of a profession required particular self-discipline, tolerance for failure, and the courage to take up challenges without a guarantee of success. They underscored how demanding their work was and how important it was not to treat it as a way of life in order to deal with responsibilities (not only professional ones) effectively:

> It is hard work, I decide when something starts and, what is worse, when it ends, and it has to be revealed to the world and given to the lions (laughs); but it is the nature of this profession, so I try not to overthink it, not to treat these things too seriously, bearing in mind that this is a job to be done and not everyone has to like it … None of my successes or failures specifically follow me home, because there is a time to relax and breathe. And why should others have to suffer for such a crazy job I chose? *Film; male*

Finally, the few interviewees who achieved creative success spoke of creative work in accordance with the fifth view: as an additional activity, hobby, passion, or even a whim. Due to the pleasure derived from the activity and the ephemeral nature of the creative product, they treated creativity as an activity for satisfying the egotistic impulse and as an escape from daily chores. This view is illustrated in the following extract:

> Family always comes first, before work, before anything. Everything else can wait—after all, this work will not run away. Of course, I like it; it is very pleasant and a little selfish, a kind of detachment from everything, but one cannot think of just me, myself, and I. *Film; male*

All of the views listed previously seem to be rooted in historical beliefs, held across the ages, about the creator's role. The idea of creativity as a gift and a mission to complete seems to have its roots in the Christian Middle Ages, when only God was a creator and artists only channeled divine expression (see Bain, 2005). This outlook seems to be reflected in the following words of a Polish director describing what he means by creativity:

> I believe, so it's a matter of faith, that this doesn't come solely from within. Somewhere deep down, I believe that I'm a proxy and that the quality of the final work depends on my "purity." I have the chance, now and then, to be connected … connected to a kind of place from which I can kind of extract it from. And that's when the most important things get made—things which shape and change me and, by extension, those around me who receive this work. And this is a great privilege, an incredible opportunity. Obviously this rarely happens, it's usually difficult to maintain such a state. And what's left when that's gone is some form of dexterity, skill; that's when all that's left is craftsmanship. However, I do think we can talk about some kind of revelation. I've felt pretty strongly when something important was about to come to

life, and I was usually right. I had this feeling …, well, a feeling of being connected to some place which escapes words, which is impossible to convey … and one shouldn't even have a look in there and define it. *Film, male 2*

What is clear in all of the types of professional creators is also an echo of romanticism (see Bain, 2005). The subjects—to varying degrees— shared the conviction that their work required special sacrifice, moving into the shadow, and ridding oneself of material goods and comforts (see Csikszentmihalyi & Getzels, 1973), and that it often required suffering pain, madness, or misfortune (Beech, Glimore, Hibbert, & Ybema, 2016; Hoede-maekers & Ybema, 2015; Kaufman, Bromley, & Cole, 2006). The beliefs listed previously may be a source of inner conflict (Gotsi, Andropoulos, Lewis, & Ingram, 2010) in cases when adapting to the requirements of the market is necessary (Coulson, 2012; McKinlay & Smith, 2009) and in cases of concurrent employment in nonartistic positions (Bain, 2005; Craig, 2007; Lena & Lindemann, 2014; Lingo & Tepper, 2013; Montgomery & Robin-son, 2003; Pachucki, Lena, & Tepper, 2010) or when a fulfilling private life is concerned (Lebuda & Csikszentmihalyi, submitted for publication).

> There comes a moment when we first want to get a job in a theater we dreamed of, then we cover all the theaters in Warsaw, then we start looking in provincial theaters, then we start attending auditions; film auditions at first, then TV series, then we start going to advertisement auditions so we can pay the bills. For the type of person who was taught a certain type of disdain for this kind of work and material all this is very difficult. It's difficult to make that mental switch and not feel the same towards your-self, right? *Film, female*
>
> This kind of work is also about sacrifices. You have to focus, give it 100%, there's no room for others then, for everyday matters. After the performance you haven't got the power—or, what's worse, you bring home all of these extreme emotions and has to do something about them, cope somehow. We can say no to roles which exhaust us, but usually these are the most interesting ones. *Film, female 2*

A sense of "special mission" or sacrifice associated with the role of a creator is required to spend time and energy on tasks that do not guaran-tee success (Gruber & Bödeker, 2005). In the case of the eminent creators who participated in our study, the professional role takes a central place, or one of two central places (alongside the role of the parent—see Lebuda & Csikszentmihalyi, submitted for publication), in self-description, and the line between personal and professional identity is fluid (see McRob-bie, 1998):

> You know, I create because I couldn't not create. I guess this is the most honest answer possible. This still gets me excited, I come up with stuff all the time, I want to try something all the time and I do so. "Art as a means of contact with reality"—it follows me since graduation, this is what my thesis was titled. And I have a strong feeling, that art is my bargaining chip; that perhaps someone might appreciate me because of it and one that helps me with social interactions which wouldn't have

happened without it. I'd be too shy or afraid or would have nothing in common with others to interact about. And, suddenly, it turns out, that there is a whole area of life in which being artistic leads me into socializing—and it wouldn't be possible otherwise. *Visual art; male*

In the case of creators who perceive being a creator as the realization of a calling, a social responsibility, or an inherent part of themselves, the creator identity is dominant, perhaps even totalitarian [Lebuda, I. (2013). *Kształtowanie tożsamości twórcy—opracowanie na podstawie problemowych analiz autonarracji Jerzego Oskara Stuhra [Creator's identity formation: A study based on problem analyses of Jerzy Oskar Stuhr's self-narratives*]. Warsaw, Poland: SWPS University of Social Sciences and Humanities. Unpublished master's thesis), as all other aspects of life fully submit to it (Roe, 1953; Taylor & Littleton, 2012; Whitbourne, 1996). This corroborates previous reports, to the effect that being a scientist operates as a master identity that surpasses even gender and race identities (see Ecklund, Park, & Veliz, 2008), and creative work is often seen not as a job or a career, but rather as a vocation or a way of life (Taylor & Littleton, 2012), described also in metaphors of religion, love, addiction, and ego idealism (Day, 2002).

Is the positive, dominant self-concept held by eminent creators the cause or effect of their success? It can be stipulated that the relationship between creative self-beliefs and creativity is reciprocal in nature: one's self-image perceived through the lens of one's profession and the belief in its exceptionality is conducive to engaging and persevering in actions that confirm this self-image, thus resulting in achievements, which in turn strengthen the said beliefs (Petkus, 1996; Tannenbaum, 1986). As Heidegger said: *The artist is the origin of the work. The work is the origin of the artist. Neither is without the other. Nevertheless, neither is the sole support of the other* (1993, p. 143).

THE DEVELOPMENT OF EMINENT CREATORS' SELF-CONCEPTS

Based on the analyzed data, we are unable to do away with uncertainties concerning causality in self-concept and achievement. We can, however, pinpoint and describe experiences extracted from the narratives of eminent creators that seem crucial for reinforcing and forming their self-image in the professional role.

The professional identity of eminent creators is formed mostly in adolescence and early adulthood (Arnett, 2006; Erikson, 1968; Porfeli & Skorikov, 2010; Skorikov & Vondracek, 2007; Stringer and Kerpelman, 2010a, 2010b, 2014a, 2014b). Although childhood and adolescence are crucial for the development of judgments concerning one's abilities

and efficacy in performing tasks (Karwowski, 2015, 2016; Karwowski & Barbot, 2016), we focus mostly on experiences related to preparing for professional work and on the work itself, as these are crucial for the formation of beliefs concerning the profession and one's potential to live up to its challenges. Two sensitive periods for shaping one's self-image as a creator are suggested—the beginning of the last stage of education intended to prepare for work and the transition from school to the job market (Jutti & Littleton, 2012; MacNamara, Holmes, & Collins, 2006, 2008). These are periods in which negotiating one's self-image takes place alongside the clash of expectations and market realities: one seeks new opportunities to define oneself in a given role and creates a unique professional identity (Jutti & Littleton, 2012). Based on interviews with eminent artists and scholars, we determined the main sources of experiences that strengthen the creative self-concept of professional and eminent creators across their career (see Bandura, 1977).

The first category of factors shaping the concept of professional role and one's own capabilities to fulfill it is interpersonal relations. In the early stages of vocational education, direct communication from the role models, mentors, and significant persons who are authorities in a particular domain are very important (see Getzels & Csikszentmihalyi, 1976). An important experience is the relationship with a *mentor* (direct commutation or sometimes even the very interest of the mentor, establishing a relationship with someone acclaimed in the domain), which signifies that one is a "promising" artist or scholar. Teachers' acknowledgment of a person's ability and identity is of great importance: it helps spark, stick to, and develop interests. Mentors introduce the young apprentice to important representatives of the field or to the unwritten rules of the domain (Csikszentmihalyi, 1996, p. 185). At the Pro-c level, feedback from the field matters greatly: it takes the form of positive appraisal, awards, or other tokens of appreciation. A sense of being noticed and acknowledged is important. This is a moment in time that creators can pinpoint accurately. Perhaps this is their crystallizing experience (Walters & Gardner, 1986):

> "Jerzy, this was professional acting!"—Megalomania carried me away for a moment! I felt that a promotion happened, liberation from the master. The day after this statement he proposed to move me to a more advanced course. The Faculty Council accepted this proposal, the Ministry approved it, and suddenly I was in my 4th year, approaching graduation. It was probably the first time something like this happened at the theatrical faculty, at least in Cracow. My God! I will get my diploma soon, my first salary, I'll be done with restaurants and culture centers. I am a professional! **Stuhr (1992, p. 134–135)**

At the Big-C level, esteem among peers is of particular importance—esteem among other professionals, selected, and respected:

> It is not good reviews, not prizes for the young and talented, and not autographs that are important, but the approval of the community, encouragement from directors, not letting them down as an artist and—which is probably the most important—as a person, as a partner in the creative process. *Stuhr (1992, p. 187)*

Lastly, public reception is a valued source, though more relevant in the case of artists than in the case of scholars (see Mockros & Csikszentmihalyi, 1999; Wallace & Gruber, 1989). It comprises not only expressions of respect and acknowledgment but also feedback about how significant one's work is to other people. Experiencing the product's impact shapes the sense of identity and meaningfulness of creative endeavors:

> My life has changed. I became someone everyone wanted to meet, talk to, and exchange views with. *Stuhr (1992, p. 266)*

In later stages of adulthood, feedback from protégés and successors grows in significance. Their will to collaborate or learn together is proof of the relevance of one's resources and mastery in the domain.

> They motivate me through confirmation. Contact with them is an evaluation of whether my convictions withstand the test of time. I proclaim some view and I am curious if my students turn away from it. *Stuhr (2000, p. 14)*

In forming one's self-image as a creator and the sense of self-efficacy, a person embarks on a relay race: information from previous generations is of particular value at the beginning of one's career. What becomes important later is feedback from one's peers and personal experience and, finally, students' and successors' judgment.

Throughout the career, what is important for one's self-concept in a professional role is affiliation with a reference group, a professional group, especially one working in a particular artistic movement or within a scientific framework or one that aspires to the same standards of perfection (see Wallace & Gruber, 1989, pp. 12–13). This is illustrated by the words of the already cited Polish actor and director Jerzy Stuhr: "passion was an attribute that was common for all of us then" (Stuhr, 1992, p. 80). A feeling of being accepted and acknowledged by members of one's reference group is crucial (see Mockros & Csikszentmihalyi, 1999; Wallace & Gruber, 1989). Reaffirmation from the group's members develops self-efficacy and creates conditions for seeking one's autonomy and uniqueness within a larger group (Haslam, Adarves-Yorno, Postmes, & Jans, 2013).

Another source of creators' self-concepts is comparisons to a past self, the assessment of one's progress, as well as comparisons with others, including mentors, role models, and authorities. All of these are proof of proper development, the right outlook, and the right understanding of the domain. Stuhr recollects:

> I was absolutely amazed while working with great directors, particularly with Andrzej Wajda, when I discovered that we thought and implemented our thinking in a similar way. *Stuhr (1992, p. 143)*

Less frequent, though existent nonetheless, are downward comparisons, which highlight one's distance from "others": especially those in the "worse" kind of art or science or those who develop more slowly (see Taylor & Littleton, 2012). For example, artists who were involved in the opposition in the communist Poland separate themselves from those who did not express their solidarity, and the creators from older generations underline their dissent from commercialization and younger artists' poor ethic. Such comparisons, based on a polarization between one's own group and others outside it, help to underline the high value of the chosen attitudes, manifested by participation in certain groups and movements.

Another source of information about oneself in the context of the role one plays is emotions and private feelings, especially self-assessment in terms of key professional competencies. Creators assess their own performance and execution and verify whether or not they have mastered certain skills, especially in areas that proved to be difficult in the past, such as command over one's body or the ability to limit the arousal caused by the stresses of exhibiting one's work.

> The ability to control my body, acquired through difficult and boring everyday practice, helped me. *Stuhr (2000, p. 133)*

Such self-observation with regard to the tasks faced by the creator also makes it possible to draw conclusions about the determinants of efficient functioning in a particular role.

Throughout their career, eminent creators sought information that would be objective proof of their ability and acclaim—something to prove they were "professional." At the early stages of their career they focused on proving their professionalism by obtaining a diploma from an appropriate school, by employment, by showcasing their work in places of the highest prestige, or by being able to provide for themselves and their family by doing creative work professionally. What is also important is attributes proving or signaling the role played to society—for instance, having one's own studio (Getzels & Csikszentmihalyi, 1976) or residing in neighborhoods typical for a given group of creators (Karenjit, 2013; Tepper, 2011).

CONCLUSIONS

Views concerning the role of a creator and one's own abilities to face the challenges that this role involves develop mostly during vocational training and in the first years of work.

For a sense of self-efficacy as a professional creator, one needs to experience personal transgression, overcome personal weaknesses, and acquire key competencies. One also needs a formal or symbolic confirmation that one belongs to the profession, such as obtaining a diploma from an art school, being granted an academic scholarship, and having attributes associated with the profession. However, what is crucial for these self-concepts of creators is relationships with other people (Csikszentmihalyi, 1996; Glăveanu & Tanggaard, 2014), at first, mostly in the form of feedback from experienced representatives of the field and domain, with time transitioning to include feedback from peers, and in later adulthood—from students and successors. The more experienced creators are, the greater weight they attach to forming beliefs about themselves in the professional role based on opinions and feedback from people within the same artistic movement or group or from those who share similar opinions about the domain. Besides growing into the domain, creators tend to highlight their social identity more—their being part of a particular artistic movement or school of thought. By comparing themselves to others, they signal a connection with the people they admire—members of their own group—and they distance themselves from those outside their realm of aspiration.

Some eminent creators consider their work to be a kind of calling, a mission, and an absolutely essential part of life (Bain, 2005). A smaller group point to creativity as leading to the choice of a difficult profession. In both cases, what is clear is the belief in the necessity to devote oneself to this role, to surrender to it completely, or, at the very least, they signal difficulty in balancing professional work with other areas of life. The role of a creator occupies the central place in one's self-description and sometimes happens to be completely integrated with one's personal identity.

Based on the analyses presented, it is hard to determine whether the self-concept of acclaimed creators is the result or the cause of their professional success. However, we can state that creative activity often occupies a central place in their life, and that—in their opinion—the role of a creator entails numerous sacrifices and hardships (Lebuda & Csikszentmihalyi, submitted for publication). Perhaps this belief, alongside social support from significant persons including representatives of the domain who share a given artistic or scientific vision, enables them to cope better in situations of potential failure and challenges and to invest in their own personal development and improvement. As a consequence, it leads them to success. However, in order to confirm these intuitions, more research beyond the elite creators is needed.

Acknowledgment

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Further Reading

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Integrating Multiple Constructs

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Creativity Is Influenced by Domain, Creative Self-Efficacy, Mindset, Self-Efficacy, and Self-Esteem

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Research on the validity of self-perceptions of creativity has produced mixed results. Some studies find a correspondence between self-beliefs and performance, yet others find that the participants who claim to be most creative are not actually producing the most creative work and vice versa. Yet even in the studies showing a positive relationship between self-perception and performance, the relationships tend to be moderate at best. For example, Karwowski (2011) found a weak relationship between drawing performance and creative self-efficacy ($r = 0.15$). Weak to moderate correlations ($r = 0.15$–0.31) were found in another study examining the relationship between self-ratings and divergent thinking, as well as everyday creativity (Batey, Furnham, & Safiullina, 2010). Even the strongest evidence for creative metacognition is not terribly strong.

Our past work has also shown that creative metacognition is weak (Pretz & McCollum, 2014). In our research, we found that creative self-efficacy was unrelated to actual performance on creative tasks. Global self-perceptions of creativity reflected personality or past creative achievements rather than performance on current tasks. Only when self-ratings were obtained immediately after completing a creativity task specifically in reference to that task were they found to be accurate.

DOMAIN SPECIFICITY AND SELF-PERCEPTIONS OF CREATIVITY

One explanation of this pattern of findings is that creative self-perceptions are domain-specific in the same way that creativity is domain-specific (Baer, 2010). When participants are asked to self-report their overall creative ability, they may have specific examples in mind, which skew their ratings to be more or less in line with the measure of creative performance used by the researcher. Some evidence from past research supports this interpretation. When school-age students rated their ability to be creative in science and math specifically, those ratings were significantly related to their teachers' ratings of their creativity in those domains (Beghetto, Kaufman, & Baxter, 2011). Karwowski, Gralewski, and Szumski (2015) showed that the relationship between creative self-efficacy and teacher ratings of creativity was quite a bit stronger for female middle-school students than for males, especially in the domain of verbal creativity. Karwowski and coworkers reasoned that female students are more responsive to teacher expectations, leading to a stronger influence of teacher ratings on self-beliefs in their creative ability. These patterns were found in both verbal and mathematical domains of creativity even when controlling for baseline level of creative potential on a divergent thinking task. In contrast, our work that failed to show much relationship between self-ratings and performance had examined creativity in domain-general tasks (Pretz & McCollum, 2014).

One recently developed measure of domain creativity is the Kaufman Domains of Creativity Scale (K-DOCS; Kaufman, 2012). Based on the Amusement Park Theoretical Model of creativity (Baer & Kaufman, 2005), it assesses self-perceived creative ability in five domains: everyday creativity, scholarly creativity, performance creativity, scientific creativity, and artistic creativity. A recent validation study of the K-DOCS showed that the five scales are independent and have construct and discriminant validity (McKay, Karwowski, & Kaufman, in press). Results showed that self-reported creativity on each of the K-DOCS subscales was related to creative achievement in the same domains, as measured by the Creative Achievement Questionnaire (Carson, Peterson, & Higgins, 2005).

Another way to examine domain specificity of creative self-ratings is to examine creative metacognition for different levels of creativity using the 4-C model of creativity (Kaufman & Beghetto, 2009). Kaufman, Beghetto, and Watson (in press) showed that elementary students' self-ratings of mini-c and little-c creativity were aligned with expert ratings of creativity. Students rated their creativity on a picture they drew, a caption they wrote for a cartoon, and a brainstorming task in a scientific domain. Results showed that students' ratings of mini-c creativity on the drawing and caption tasks were significantly related to expert ratings of creativity

on those tasks and not related to creativity on the other tasks, suggesting that children can distinguish between their creative ability in various domains. Notably, Kaufman and coworkers found that these domain-specific self-ratings were more closely aligned with expert ratings than were global self-assessments of creativity, corroborating our earlier work (Pretz & McCollum, 2014).

Others have found that self-assessments of creative ability vary by major field of study. For example, Kaufman, Pumaccahua, and Holt (2013) found that students majoring in Artistic fields (e.g., art, music, languages, and humanities) rated themselves as more creative than did students in Realistic (criminal justice, political science), Investigative STEM (biology, chemistry, engineering, computer science), and Social (nursing, social work) majors. However, the same students did not score higher on one measure of creativity, the compound remote associates task. These results are similar to those of another study by Furnham, Batey, Booth, Patel, and Lozinskaya (2011). Arts and Science majors did not differ on divergent thinking, but Arts majors rated themselves as more creative. In this study, Arts majors also had higher scores than Science majors on creative achievement, suggesting that self-reported creativity was valid and based on past experience despite the fact that the divergent thinking task used in the study failed to reflect this group difference. Unfortunately, this finding was not replicated in their second study. Arts, Social Sciences, and Science majors differed only in self-reported creativity, not divergent thinking or creative achievement.

We further explored the domain specificity of self-perceived creativity in our first study. We expected to find stronger correspondence between self-ratings and creative performance when both were in the same domain. Specifically, we expected that self-perceived creativity in specific domains would be more strongly related to creative performance than global self-perceptions of creativity. Second, we predicted that Arts majors' domain-specific creativity would be more related to self-perceived creativity in Performance and Arts than self-perceived creativity in other domains. Finally, we expected that Science majors' domain-specific creativity would be more related to self-perceived creativity in Math/Science than self-perceived creativity in other domains.

STUDY 1

The data used in this study were part of a larger project. For this study, data were obtained from 289 applicants to Elizabethtown College (64% female). We coded participants by intended major: Arts/Humanities/Social Sciences ($N = 88$), Natural/Physical Sciences ($N = 114$), and Professional Studies (Business and Education; $N = 62$). These participants

represent a subset of two cohorts of applicants to the College in the year 2011–12 and 2012–13. Data from the 2011–12 cohort of applicants were also analyzed in our prior work (Cotter, Pretz, & Kaufman, 2016; Pretz & Kaufman, in press).

The supplemental application included three creativity measures, two domain-general and one domain-specific. One domain-general measure was a divergent thinking task. Students brainstormed uses for a million dollar donation to the College (2011 cohort) or uses for a paper clip (2012 cohort) and indicated their top two responses (Silvia et al., 2008). The second domain-general measure asked participants to write a caption for an ambiguous photograph. Finally, applicants in both cohorts were asked to write an essay describing their dream project in their intended field of study (domain-specific task) within a 10-minute time period. Participants were prompted to "Dream big and be creative!" when describing their project ideas. All three creativity measures were scored by a team of six undergraduates using the consensual assessment technique (Amabile, 1996). The research assistants rated each of the top two responses, the caption, and the essay on a scale of 1 (not at all creative) to 6 (highly creative). Interrater reliability was good (greater than 0.70) for all measures for both cohorts.

Self-reported creativity was assessed using the K-DOCS (Kaufman, 2012). In this scale, participants rate their creative ability relative to their peers on a scale of 1 (much less creative) to 5 (much more creative) in five domains: Everyday (interpersonal relationships, work–life balance), Scholarly (writing, analysis), Performance (music, theater), Math/Science (problem solving, experimental design), and Arts (visual arts, arts appreciation). Students also completed Beghetto's (2006) three-item measure of creative self-efficacy. Openness to experience was also assessed using 10 items from Goldberg's (1992) 50-item measure of the Big Five from the Interpersonal Personality Item Pool (Goldberg et al., 2006). Each of these measures had good internal reliability (Cronbach alpha > 0.70).

Participants received an email inviting them to complete optional supplemental application materials after submitting the regular admission application. The supplement consisted of the three measures of creative performance. After enrollment at the College, students completed the self-report measures of creativity and personality as part of their orientation program.

Results

Descriptive statistics for each creativity measure by major field of study are presented in Table 9.1. Arts/Humanities/Social Sciences students scored significantly higher than Professional students on self-reported creativity in Scholarship and Performance, and on Openness to experience with Science majors scoring in between these groups. Arts/Humanities/Social Sciences and Science majors rated themselves as significantly

TABLE 9.1   Creativity Measures by Major

	Arts/Humanities/ Social Sciences M (SD)	Sciences M (SD)	Professional M (SD)	F (2, 261)
Everyday	3.855 (0.5367)	3.886 (0.5061)	3.865 (0.5747)	0.086
Scholarly	3.430 (0.7268)[a]	3.286 (0.5757)[a,b]	3.127 (0.6765)[b]	3.934*
Performance	3.160 (0.9804)[a]	2.880 (0.7796)[a,b]	2.757 (0.9070)[b]	4.348*
Math/Science	2.460 (0.8975)[a]	2.838 (0.7961)[b]	2.446 (0.7791)[a]	6.984**
Arts	3.226 (0.8880)[a]	3.277 (0.8160)[a]	2.871 (0.8989)[b]	5.985**
Creative Self-Efficacy	3.989 (0.8156)	3.724 (0.8195)	3.750 (0.7446)	3.008
Openness	3.731 (0.6469)[a]	3.569 (0.5610)[a,b]	3.470 (0.6165)[b]	3.650*
Divergent thinking	2.747 (0.9710)	2.518 (0.7921)	2.437 (0.6788)	2.990
Caption	2.843 (1.148)	2.564 (1.069)	2.597 (0.9402)	1.856
Essay	2.999 (0.7794)	2.893 (0.8792)	2.848 (0.7149)	0.728

*P < 0.05.
**P < 0.01.
[a,b]Means with different subscripts are significantly different at P < 0.05

more creative in the Arts than Professional majors. Although there were no significant group differences for creative self-efficacy or any of the creative performance measures, the general trend showed that students in the Arts/Humanities/Social Sciences had the highest scores on all of these variables. One notable exception was that Science majors rated themselves as more creative in Math/Science than students in either Arts/Humanities/Social Sciences or Professional fields. This provides some evidence that some students recognize their creative ability in their major field of study.

In order to test our hypotheses about the relationships between self-perceived creativity and performance, we conducted correlational analyses for the overall sample and for the three subsets of students based on major field of study. First, we compared the correlations between scores on the K-DOCS subscales and performance with correlations of general creative self-efficacy and performance to test the prediction that self-perceived creativity in specific domains would be more strongly related to creative performance than global self-perceptions of creativity (Table 9.2). Overall creative self-efficacy was weakly correlated ($r = 0.198$, $P < 0.01$) with Caption creativity but not with divergent thinking (DT) or Essay creativity. K-DOCS domains were also significantly and weakly

TABLE 9.2   Correlating Self-Perceptions With Creative Performance

	DT	Caption	Essay
Everyday	−0.087	−0.021	−0.151*
Scholarly	0.044	0.210***	−0.007
Performance	0.074	0.177**	−0.065
Math/Science	0.047	−0.065	0.079
Arts	0.061	0.139*	−0.040
Creative Self-Efficacy	0.063	0.198***	0.048
Openness	0.126*	0.196**	0.043

*P < 0.05.
** P < 0.01.
*** P < 0.001.

(significant r = 0.139–0.210) related to Caption creativity but none of the other measures of creativity performance. Math/Science creativity was unrelated to any of the performance measures, and Everyday creativity was found to correlate weakly and negatively with Essay creativity (r = −0.151, $P < 0.05$). These patterns do not support the hypothesis that domain-specific creativity will have a stronger relationship with actual creative performance than general self-perceptions of creativity. However, we reasoned that these relationships may be obscured because our analyses were conducted on the entire sample of students.

To follow up, we conducted the same analyses on each subset of the sample separately. This revealed differing patterns of relationships. Overall creative self-efficacy was associated with Caption creativity for students in the Arts/Humanities/Social Sciences and Professional field (r 0.269 and 0.238, respectively) but not for Science majors (r = 0.123) (Table 9.3). None of these correlations were statistically different from one another ($P > 0.05$). Furthermore, the positive relationship between Scholarly creativity and Caption creativity was moderate for the Arts/Humanities/Social Sciences majors (r = 0.337, $P < 0.01$) but nonsignificant for the other students in the sample. Specifically, the relationship for Arts/Humanities/Social Sciences majors was significantly stronger than that for Science majors ($P < 0.05$). The correlation did not significantly differ from that for Professional majors. Similarly, Openness to experience was associated only with Caption creativity for Arts/Humanities/Social Science majors (r = 0.298, $P < 0.01$) but not for other students. However, none of these correlations were significantly different from one another ($P > 0.05$). In general, the relationship between self-perceived creativity and performance was weak for those in the Sciences and Professional

TABLE 9.3   Correlating Self-Perceptions With Caption Creativity by Domain

	Arts/Humanities/ Social Sciences	Sciences	Professional
Everyday	0.107	−0.047	−0.136
Scholarly	0.337**	0.081	0.172
Performance	0.166	0.183*	0.099
Math/Science	0.057	−0.107	−0.152
Arts	0.177	0.157	−0.014
Creative Self-Efficacy	0.269**	0.123	0.238*
Openness	0.298**	0.111	0.140

* P < 0.05.
** P < 0.01.

majors. Notably, we found that the negative relationship between Everyday creativity and Essay creativity was found only among the Science majors ($r = -0.280$, $P < 0.001$). This correlation was significantly stronger than that found for Arts/Humanities/Social Sciences majors ($P < 0.05$), but not significantly different from that for Professional majors. A similar pattern was observed for Everyday creativity and Divergent thinking creativity among Science majors ($r = -0.224$, $P < 0.05$). This relationship was significantly different than that found for Professional majors ($P < 0.05$) but not for Arts/Humanities/Social Sciences majors.

We tested our hypotheses about performance in domain-specific creativity by examining the relationship between self-reported creativity and Essay creativity (Table 9.4). Because students wrote their essays about projects in their intended field of study, these were domain-specific measures of creativity. We predicted that Essay creativity among Arts majors would be most strongly related to self-perceived creativity in the Arts and Performance domains as measured by the K-DOCS. Contrary to our predictions, these relationships were not significant ($r = -0.069$ and -0.160, respectively). We also predicted that Science majors would show a stronger relationship between Essay creativity and scores on Math/Science creativity. This relationship was positive, but nonsignificant ($r = 0.146$). There was no support for our hypothesis that domain-specific self-ratings would be related to creative performance in those domains.

Discussion

These weak relationships show that domain-specific self-reports also failed to show substantial relationships with performance in

TABLE 9.4   Correlating Self-Perceptions With Essay Creativity by Domain

	Arts/Humanities/ Social Sciences	Sciences	Professional
Everyday	−0.001	−0.280**	−0.111
Scholarly	−0.017	−0.054	0.048
Performance	−0.160	0.006	−0.137
Math/Science	0.098	0.146	−0.023
Arts	−0.069	−0.074	−0.031
Creative Self-Efficacy	−0.041	0.045	0.097
Openness	−0.028	0.049	0.099

** $P < 0.01$.

domain-general and domain-specific creativity tasks. We found some evidence that domain-based self-perceptions have somewhat stronger relationship with domain-general creativity. Yet domain-specific self-perceptions do not correspond well to domain-specific creative performance.

Our results add to a growing body of evidence that students lack creative metacognition (Kaufman & Beghetto, 2013). In the future, researchers should attempt to replicate this finding with multiple indicators of domain creativity in larger samples of participants with more domain expertise classified into more narrow domains (not grouping Arts with Humanities and Social Sciences). Our sample was a group of young adults with limited experience in their intended fields of study. Past work has shown stronger relationships with creative self-perceptions and creative performance when using adult samples (e.g., Tierney & Farmer, 2002). In addition, past experience in a domain would have provided participants with the opportunity to get feedback on their creativity in that domain, a critical element of developing accurate creative metacognition (Kaufman & Beghetto, 2013). Another weakness is that our study used only one measure of domain creativity (dream project essay), which was always a verbal response, limiting its validity as a domain-related measure. Future work should consider using multiple assessments of domain creativity, as well as creative achievement. Prior research has shown some correspondence between self-perceptions and past achievement (e.g., Pretz & McCollum, 2014).

One clear trend observed in this study was that the validity of global self-perceptions of creativity varies by major field of study. Correspondence between self-perceptions and performance was significant for students in the Arts/Humanities/Social Sciences, suggesting that this group

may have relatively good creative metacognition. Another clear finding was that Science students are quite different from those in other fields. Our results show that the most creative science students do not think they are very creative in everyday situations. If domain-specific self-perceptions exist, they are likely to be found in the sciences. Science students may not view themselves as creative when asked in a general sense because it triggers a stereotype of an artistic domain. This interpretation is consistent with prior work showing that students in Science majors tend to rate themselves as less creative than those in Arts majors despite the fact that they may have similar levels of creativity on certain tasks (Furnham et al., 2011).

CREATIVITY AND SELF-RELATED MEASURES

Our work has suggested that self-perceptions of creativity are not strongly related to performance on creative tasks, even when creativity and the self-perceptions are specific to a domain. In the past, we have also found that past creative achievement was equally strongly predicted by global creative self-efficacy and openness to experience (Pretz & McCollum, 2014). Perhaps self-perceptions of creativity are influenced by beliefs about the nature of creativity and an individual's self-concept just as much as they are related to actual creative performance.

Self-perceptions of creativity may be influenced by creative self-efficacy, creative personal identity, general self-efficacy, self-esteem, or creative mindset. Creative mindset refers to a person's implicit theory about whether creative ability is set and unchangeable (fixed or entity mindset) or whether it can be nurtured (growth or incremental mindset). Karwowski (2014) showed that growth mindset was positively correlated with insight problem solving. Furthermore, O'Connor, Nemeth, and Akutsu (2013) found that lower scores on beliefs in malleability of creativity were associated with lower interest in creative thinking and less self-reported subjective creativity. In contrast, higher scores on beliefs in malleability of creativity predicted better scores on an Unusual Uses task. O'Connor and colleagues also showed that lower scores on beliefs in malleability of creativity were associated with lower creative achievement scores.

Self-efficacy is one's belief in one's ability to be successful in a specific task and can be specific or general. General self-efficacy can positively influence specific self-efficacy across tasks and situations (Imam, 2007). Previous studies found that participants with low self-efficacy scored significantly higher on fixed mindset tests (Komarraju & Nadler, 2013), suggesting that higher self-efficacy may be associated with higher creativity.

Self-esteem, or one's overall self-worth, is related to the belief in the ability to improve with effort, and has been found to predict creative performance (Goldsmith & Matherly, 1988; Shukla & Sinha, 1993) and self-perceived creativity (Karwowski, 2009). Yau's (1991) examination of the connection between creativity and positive self-image led her to propose that high self-esteem is necessary for high levels of creative achievement.

In this study, we explored the relationship between self-perceptions of creativity and other self-related constructs to observe their relative validity in predicting creative performance. We examined creative self-efficacy, creative personal identity, general self-efficacy, self-esteem, and creative mindset to explore the relationship of each to creativity in a divergent thinking task and a collage-making task. We expected that creativity would be positively related to the growth mindset (hypothesis 1) and negatively related to a fixed mindset (hypothesis 2). We also predicted a positive relationship between creative performance and creative self-efficacy (hypothesis 3), as well as general self-efficacy (hypothesis 4). We expected that self-esteem would also be positively related to creative performance (hypothesis 5). We expected that creative self-efficacy would be more strongly related to creative performance than general self-efficacy or self-esteem (hypothesis 6).

STUDY 2

One hundred and two undergraduate students (56.4% female; M age = 19.14, SD = 1.55; 86.9% Caucasian, 6.1% Hispanic, 5.1% Asian or Pacific Islander) were recruited from the General Psychology participant pool to participate in a research study on creativity.

Participants completed several measures of creativity and self. Self-perceived creativity was measured using the Short Scale of Creative Self (Karwowski, 2012), which consists of 11 items that yield scores on creative self-efficacy, creative personal identity, and creative self-concept. Creative self-efficacy refers to beliefs about one's own creative capabilities. Creative personal identity describes how much creativity is valued and treated as an important part of an individual's identity. Responses are recorded on a 5-point Likert scale. Sample items include "I trust my creative abilities" and "My creativity is important for who I am" (Karwowski, 2012). The Creative Mindset measure (Karwowski, 2014), a 10-item scale that measures whether one finds creativity as incremental or fixed, was also administered. Participants evaluate the questions on a 5-point Likert scale following 1 (definitely not) to 5 (definitely yes). Sample questions include the following: "Some people are creative, others aren't—no practice can change it" (fixed mindset) and "It doesn't matter what creativity level one reveals—you can always increase it" (growth mindset).

Self-efficacy was measured using the Sherer et al. (1982) General Self-Efficacy Scale. Participants evaluated the 17 items on a 5-point Likert scale following 1 (strongly disagree) to 5 (strongly agree). Sample questions include the following: "I give up easily" and "I am a self-reliant person" (Sherer et al., 1982). This measure was completed by a subset of 58 participants. Self-esteem was measured using the Rosenberg Self-Esteem Scale (Rosenberg, 1965), which consists of 10 items that yields a score on global self-worth by measuring positive and negative feelings about the self. The items are reported using a 4-point Likert scale following 1 (strongly agree) to 4 (strongly disagree). Sample questions include the following: "On the whole, I am satisfied with myself" and "I feel I do not have much to be proud of" (reverse-scored) (Rosenberg, 1965). This measure was completed by a subset of 58 participants.

Participants completed a divergent thinking task (uses for a bed sheet). Responses were scored for Fluency (total number of responses) and Originality (the uniqueness of each answer compared with the entire sample). Originality scores were determined by attributing a point system to percentages. If only 1% of the participants gave a response, 2 points were appointed. If the response was given by only 5% of the participants, 1 point was given. If the response was given by more than 5% of the participants, no points were given. Finally, a ratio score of the two components (originality/fluency) was calculated to account for the possibility that higher originality was a product of greater fluency (O'Connor et al., 2013). Participants also created a collage using an 8.5 × 11 in. white sheet of paper and 50 various foam pieces. Collages were rated for creativity by the experimenter and another trained, experienced undergraduate research assistant. Ratings showed reasonably good reliability ($\alpha = 0.66$), so ratings were averaged to create a creativity score for the collage.

Participants completed the study individually in a single session lasting approximately 30 minutes. First, they completed all self-report measures in order of description. Then they were given 3 minutes to respond to the divergent thinking task and 10 minutes to complete their collage.

Results and Discussion

We examined the relationship between creative performance and all self-report measures, creative self-efficacy, creative personality identity, creative mindset, general self-efficacy, and self-esteem (Table 9.5). Correlational analyses showed that growth mindset was positively related to Rated creativity on the collage but not to Divergent thinking scores, partially confirming the first hypothesis. Fixed mindset was not related to any measure of creative performance, failing to confirm the second hypothesis. Creative self-efficacy and Creative personal identity were positively related to Rated creativity and originality/fluency scores, confirming the

TABLE 9.5 Correlating Self-Report Measures With Creative Performance

	Creative Personal Identity	Fixed Mindset	Growth Mindset	General Self-Efficacy	Self-Esteem	Rated creativity	DT Fluency	DT Originality	DT Originality/ Fluency
Creative Self-Efficacy	0.663***	−0.039	0.335**	0.454***	−0.220+	0.425***	0.062	0.161	0.203*
Creative Personal Identity		−0.295**	0.360***	0.229+	−0.204	0.409***	0.071	0.159	0.234*
Fixed Mindset			−0.384***	0.131	−0.061	−0.067	0.143	0.118	−0.024
Growth Mindset				0.094	−0.130	0.267***	0.079	0.044	−0.025
General Self-Efficacy					−0.032	0.168	0.243+	0.295*	0.155
Self-Esteem						0.208+	0.300*	0.262*	0.013
Rated Creativity							0.248*	0.281**	0.220*
DT Fluency								0.858***	0.170+
DT Originality									0.620***

Note: N = 102 except general self-efficacy and self-esteem for which N = 58.

+ P < 0.10.

* P < 0.05.

** P < 0.01.

*** P < 0.001.

third hypothesis. General self-efficacy and Self-esteem were correlated with divergent thinking scores but not with rated creativity, partially confirming hypotheses 4 and 5. Notably, General self-efficacy and Creative self-efficacy were moderately related ($r = 0.454$, $P < 0.001$), although Creative self-efficacy but not General self-efficacy was significantly correlated with Rated creativity. General self-efficacy and Self-esteem were found to relate to DT fluency and originality but not significantly with Rated creativity.

To better understand whether creative self-efficacy was more strongly related to performance than general self-efficacy and self-esteem, we conducted a series of regressions to test hypothesis 6. All three self variables were used to simultaneously predict each creative performance variable. Results showed that Creative self-efficacy and Self-esteem were the strongest predictors of creativity. For Rated creativity, both Creative self-efficacy and Self-esteem were significant predictors ($\beta = 0.627$ and 0.343, respectively), explaining 36.9% of the variance [$F(3, 54) = 10.534$, $P < 0.001$]. A similar result was found for DT Fluency. However, in this case, Self-esteem ($\beta = 0.359$, $P = 0.006$) was a stronger predictor as compared with creative self-efficacy ($\beta = 0.241$, $P = 0.089$). Together with General self-efficacy ($\beta = 0.144$, ns), these variables explained 19.8% of the variance in Fluency scores [$F(3, 54) = 4.453$, $P < 0.01$]. For DT Originality, the self variables predicted 26.3% in the variance [$F(3, 54) = 6.464$, $P = 0.001$]. In this analysis, Creative self-efficacy ($\beta = 0.371$, $P = 0.008$) and Self-esteem ($\beta = 0.348$, $P = 0.005$) were equally strong predictors. The regression for DT Originality/Fluency was marginally significant, explaining 11.5% of the variance in scores [$F(3, 54) = 2.338$, $P = 0.084$]. Only Creative self-efficacy was a significant predictor ($\beta = 0.347$, $P = 0.022$). In this case, the predictive power of Self-esteem was negligible ($\beta = 0.090$, $P = 0.498$).

These analyses show that participants' overall self-perceptions were most strongly related to Rated creativity and DT Originality scores. Rated creativity was more strongly associated with higher Creative self-efficacy, and Fluency was more strongly associated with higher levels of Self-esteem. Originality scores were predicted equally strongly by both of those variables. General self-efficacy had no significant unique relationship with any measures of creative performance.

This pattern of results suggests that self-esteem is associated with higher levels of productivity, but higher-quality creative work is associated with creative self-efficacy. Originality scores are strongly correlated with Fluency scores, potentially explaining the equal relationship of both self variables in predicting that indicator of creative performance. We conclude that Creative self-efficacy shows good metacognition about actual creative performance in the collage (Rated creativity) task, and that this is distinct from Self-esteem, which is more associated with the ability to produce more creative ideas in general (DT fluency).

What does this tell us about self-perceptions of creativity? In contrast to the first study, this study showed that creative performance is, in fact, guided by a sense of self as creative and by a person's sense of the importance of creativity in their identity. This relationship was strongest for the collage task, a task that may have been more familiar to participants than the tasks used in the first study. Study 2 also showed that the belief that creativity can be nurtured (growth mindset) was associated with higher Creative performance, confirming prior work (e.g., Karwowski, 2014). Unlike O'Connor et al. (2013), we found no relationship between creativity and fixed mindset.

This study confirmed our expectations that general positive self-image was associated with higher levels of creativity, but closer analyses showed that creative performance was not due to general self-efficacy but rather the belief in one's ability to be creative, specifically. In addition, our results suggested that self-esteem is associated with productivity but not necessarily quality.

CONCLUSIONS

In these studies, we sought to better understand the nature of self-perceptions of creativity. We proposed that creative metacognition might be greater if measured in a specific domain. Our results showed that domain-specific self-ratings were somewhat more accurate than domain-general self-perceptions, but we found very little correspondence between specific self-ratings and performance on creativity tasks in that specific domain. Furthermore, our results revealed differences in creative metacognition for different groups of participants. Students interested in the Arts/Humanities/Social Sciences were more aware of their own creativity than students in other fields of interest. Among Science students, we found that the most creative in a domain-general and a domain-specific task tended to view themselves as less creative in everyday activities. This may be objectively true, or this finding may be due to stereotypes of creativity being a primarily artistic endeavor.

Given that the domain-specific approach failed to reveal substantially higher levels of creative metacognition, we explored the relationship between creative performance and a variety of self-related measures, including creative self-efficacy, mindset, self-efficacy, and self-esteem. From this investigation, it was clear that creative self-efficacy is not simply due to general self-efficacy. This is encouraging. Participants can distinguish between their ability to be effective in creative tasks from their ability to be effective in general and from their general sense of self-worth. Notably, self-esteem was uniquely associated with higher productivity on a divergent thinking task. However, we conclude that creative self-efficacy is the

more valid predictor of the ability to produce original ideas. More work needs to be done to better understand the validity of self-perceptions of creativity for individuals of all levels of experience.

Acknowledgments

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Creativity, Self-Generated Thought, and the Brain's Default Network

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THE DEFAULT NETWORK AND ITS ROLE IN SELF-GENERATED THOUGHT

Early neuroimaging research focused largely on localization of brain function, aiming to identify specific regions underlying various cognitive processes. This seminal research, along with the field of neuropsychology, provided a wealth of knowledge on how individual brain regions support various cognitive functions. More recently, neuroscientists have shifted focus to studying the interaction of brain regions (i.e., networks; Sporns, 2014). A majority of brain network research has employed resting-state functional magnetic resonance imaging (fMRI), a technique that measures spontaneous fluctuations in blood flow in the brain while participants relax in the scanner without a task to perform. This approach has revealed several distinct sets of brain regions that exhibit correlated patterns of activity both at rest and during cognitive tasks.

The first network to be described was the so-called "default mode" or "default network," a set of midline and posterior inferior parietal brain regions that activate in the absence of external stimulation (Raichle et al., 2001). The default network was discovered incidentally in the late 1990s when neuroscientists began to pay more attention to what happens in the brain when participants are not engaged in a task. In most

neuroimaging experiments, brain activity is recorded during some task (e.g., solving math problems) and contrasted with some baseline condition; then, the activity specific to the task of interest is identified by subtracting the baseline activity from the data. Early neuroimaging studies tended to rely on a passive "resting state" as a baseline condition, where participants simply rested in the scanner without a task to perform. Initially, this resting period was of little empirical interest. But researchers began to notice a consistent pattern of brain activity that emerged across several experiments, raising questions about whether this pattern reflected some "default mode" of the brain.

Since the initial discovery of the default network, it has become increasingly clear that this network contributes to core functions of the mind (Buckner, Andrews-Hanna, & Schacter, 2008). The acknowledgment that the default network reflects an active mental state prompted a surge of research on its role in attention and cognition. Default activity has since been linked to spontaneous or self-generated cognition—the thoughts that arise in mind when people are not mentally engaged with the environment (Smallwood, 2013). Seminal research on mind-wandering and daydreaming provided a framework for conceptualizing neuroimaging research on the cognitive underpinnings of the default network. For example, self-reported mind-wandering was found to predict increased metabolic activity within the posterior cingulate during resting-state fMRI (Mason et al., 2007). Another key indication that the default network is involved in spontaneous thought came from task-based fMRI. Several studies reported decreased activity of the default network during cognitive and perceptual task performance (for review, see Buckner et al., 2008). During working memory tasks, for example, the default network tended to show decreased activity while executive control regions increased activation (e.g., McKiernan, Kaufman, Kucera-Thompson, & Binder, 2003). Researchers thus hypothesized that such "task-induced deactivation" reflects the suppression of task-unrelated thoughts during cognitive control. In other words, spontaneous and self-generated thoughts tend to decrease when the brain is engaged in a cognitively demanding task.

Yet the notion that self-generated thought is unrelated to task performance has recently been challenged (Andrews-Hanna, Smallwood, & Spreng, 2014). A growing literature now indicates that the default network and self-generated thought may support cognitive processes that require people to draw upon stored episodic or semantic knowledge. For example, the default network shows reliable activation when people recall past experiences or imagine future experiences (for review, see Schacter et al., 2012). Andrews-Hanna, Reidler, Sepulcre, Poulin, and Buckner (2010) have also identified subsystems within the default network that underlie various self-generated thought processes. For

example, the medial temporal subsystem, which is composed of the ventromedial prefrontal cortex, hippocampal formation, parahippocampal cortex, retrosplenial cortex, and posterior inferior parietal lobule, is preferentially involved in processes related to episodic memory, whereas the dorsal medial prefrontal cortex subsystem, which is composed of the dorsal medial prefrontal cortex, lateral temporal cortex, temporoparietal junction, and temporal pole, is preferentially involved in social cognition (e.g., mentalizing). Together, this work not only provides clear evidence that the default network is central to self-generated thought but also points to dissociable patterns of default activity that support specific cognitive processes.

The default network was originally characterized in terms of its relation to other brain networks, such as its negative correlation with the dorsal attention network during resting-state fMRI (Fox et al., 2005). However, several studies have reported cooperation of the default network and cognitive control networks during goal-directed processing. For example, the default and control networks show reliable coupling during autobiographical future planning—constructing a detailed and sequential mental representation about a future goal state (Spreng & Schacter, 2012; Spreng, Sepulcre, Turner, Stevens, & Schacter, 2013; Spreng, Stevens, Chamberlain, Gilmore, & Schacter, 2010). In this context, the default network may provide self-generated information via episodic retrieval while the control network directs and monitors the integration of this information within the confines of the goal state. In the subsequent text, we provide evidence that creative cognition similarly involves such goal-directed, self-generated thought.

BRAIN NETWORKS UNDERLYING CREATIVE COGNITION AND ARTISTIC PERFORMANCE

Researchers have used a range of tasks to probe the neural basis of both domain-general and domain-specific creative performance, including insight problem solving, divergent thinking, visual art production, musical improvisation, and many more (Arden, Chavez, Grazioplene, & Jung, 2010; Gonen-Yaacovi et al., 2013). Despite this active body of work, the field was initially marked by largely contradictory and inconsistent findings. This lack of clarity leads many to question whether creativity is too complex to distill down to a given region of the brain (Dietrich & Kanso, 2010). Another contention in the literature concerned whether creative thought involves more or less cognitive control. On the one hand, several studies reported activation of brain regions tied to executive processes, suggesting that creative thought may benefit from the focused attention and cognitive control. On the other hand, a substantial number of studies

reported activation of default network regions, pointing to the involvement of spontaneous, self-generated cognition (Wu et al., 2015).

Recently, a series of neuroimaging studies sought to address these controversies by employing new methods in brain network science (for review, see Beaty, Benedek, Silvia, & Schacter, 2016b). Network approaches can overcome limitations of conventional fMRI analysis by examining the interaction of multiple brain regions. One such study explored the role of the default and control networks during performance on a divergent thinking task (Beaty, Benedek, Kaufman, & Silvia, 2015). The task paradigm presented a series of common objects, and participants were asked to either generate alternates uses or simply think of the objects' characteristics (cf. Fink et al., 2009). Whole-brain functional connectivity analysis revealed a distributed network of brain regions associated with divergent thinking, including several regions of the default and control networks. Follow-up analyses showed direct functional connections between these network hubs during the task. Moreover, a dynamic connectivity analysis examined network patterns over time and found that default-control network coupling tended to occur at later stages of the task. The notion that creative cognition involves increased cooperation of the default and control networks receives further support from other recent work showing default-control connectivity during performance on other creative thinking tasks (e.g., Green, Cohen, Raab, Yedibalian, & Gray, 2015). Such findings suggest that creative thought involves cooperation among networks involved in self-generated thought and cognitive control.

Further evidence for the cooperative role of default and control networks comes from research on musical improvisation. Like divergent thinking research, early improvisation studies provided mixed evidence on the role of the control and default networks. A recent review of the improvisation literature reported activation across several brain regions, many within the default and control networks (Beaty, 2015). In a seminal study of piano improvisation, Limb and Braun (2008) reported widespread deactivation of control network regions (e.g., dorsolateral prefrontal cortex) and increased activation of default network regions (e.g., medial prefrontal cortex) in professional pianists during musical improvisation. This pattern was further reported in a study of freestyle rap artists (Liu et al., 2012), pointing to the involvement of spontaneous, self-generated processes in both instrumental and lyrical improvisation.

Because improvisation happens "on the spot" with seemingly little time for planning, one might expect the default network to benefit spontaneous generation at the cost of decreased cognitive control, thus reflected in the deactivation of control network regions during improvisation. On the other hand, improvisation has also been characterized as a complex and cognitively demanding task, requiring the real-time generation, evaluation, and selection of musical sequences (Beaty, 2015; Pressing, 1988).

The notion that improvisation involves cognitive control has received support from neuroimaging research showing increased activation of lateral prefrontal and premotor cortices (de Manzano and Ullén, 2012), brain regions involved in cognitive and motor control. The involvement of executive control regions leads some researchers to hypothesize that improvisation may require top-down performance monitoring via idea selection and goal maintenance (Pinho, de Manzano, Frannson, Eriksson, & Ullén, 2014). Nevertheless, such findings were seemingly at odds with research showing decreased activation of cognitive control regions in previous studies of musical improvisation.

Recently, Pinho and colleagues sought to address this paradox by examining brain network interactions during musical improvisation (Pinho, Ullén, Castelo-Branco, Fransson, & de Manzano, 2016). Professional pianists were asked to either express a specific emotion (e.g., joy) or use a specific set of piano keys ("pitch sets") as they improvised on a keyboard during fMRI. The emotion condition was hypothesized to induce greater default network activity while the "pitch sets" condition was expected to induce greater control network activity. Univariate analysis confirmed these predictions. Critically, a functional connectivity analysis revealed increased coupling of default and control network regions during the emotion condition, suggesting that expressing a specific emotion engages both the strategic functions of the control network and the self-referential functions of the default network. In a similar vein, Ellamil, Dobson, Beeman, and Christoff (2012) examined brain activity during idea generation and evaluation in a sample of visual arts students. They found that whereas idea generation was associated with default activity, idea evaluation was associated with control network activity. Moreover, functional connectivity analysis revealed increased coupling of the default network with the control network, but only during the idea evaluation condition.

These findings provide support for the notion that creative cognition can involve goal-directed, self-generated thought. They also provide much needed nuance to the creativity literature by revealing conditions where the default and control networks are more or less engaged. For example, when artists are asked to spontaneously improvise without task constraints, they tend to exhibit increased default activity and decreased control activity (Liu et al., 2015), suggesting that artists rely more on spontaneous and self-generated cognition in the absence of explicit task goals. On the other hand, when artists are asked to tailor their ideas to meet some goal (e.g., expressing a specific emotion), they tend to show increased cooperation of the default network with executive control regions (Pinho et al., 2016). Taken together, the involvement of the control network appears to be a function of whether creative cognition is constrained to meet task-specific goals.

Another approach to understanding the role of the default network and self-generated thought in creativity is to study the creative personality. The creative person is typified by the personality trait Openness to Experience, one of the so-called "Big Five" factors of personality associated with a tendency to engage in imaginative, creative, and abstract cognitive processes (McCrae & Costa, 1997). A recent study explored whether individual differences in default network functioning could be explained by variation in Openness to Experience (Beaty et al., 2016a). Because both Openness and the default network are tied to imagination and creativity, it was hypothesized that Openness would be related to default network "global efficiency"—a network science metric used to assess information integration within complex systems. Using graph theoretical analysis of resting-state fMRI data, two studies explored whether Openness was related to efficient information flow across a functional network made up of default network nodes and corresponding edges. Across both studies, Openness significantly predicted increased default network efficiency. Thus, as Openness increased, the default network showed more efficient information flow. In this context, the ability to efficiently engage the neurocognitive resources of the default network may account for the ability of highly Open people to generate creative ideas.

DEFAULT NETWORK AND CREATIVE COGNITION: LINKS TO EPISODIC MEMORY

We noted earlier that the default network has been linked to remembering past experiences and imagining future experiences (for review, see Schacter et al., 2012). More specifically, a set of brain regions referred to as the *core network* (Schacter, Addis, & Buckner, 2007), which largely overlaps with the default network, shows similarly increased activity when people remember past experiences or imagine future experiences (for a recent meta-analysis, see Benoit & Schacter, 2015). According to the constructive episodic simulation hypothesis (Schacter & Addis, 2007), these neural similarities, and corresponding cognitive similarities between remembering the past and imagining the future (Schacter et al., 2012; Szpunar, 2010), reflect to a large extent the influence of episodic memory on imagining future and other hypothetical experiences. Episodic memory, as classically defined by Tulving (1983, 2002), entails remembering specific experiences from one's personal past, but it now seems clear that episodic memory plays a broader role in cognition (Moscovitch, Cabeza, Nadel, & Winocur, 2016). Schacter and Addis (2007) have argued that episodic memory includes flexible retrieval processes that allow people to recombine elements of past events in order to generate simulations of novel future events that they have not yet experienced. This ability to simulate a

variety of possible future events without having to engage in the actual behaviors that are represented in simulations is thought to be a highly adaptive cognitive ability (cf., Gilbert, 2006; Ingvar, 1979; Schacter, 2012; Schacter & Addis, 2007; Suddendorf & Corballis, 2007).

Episodic simulation of possible future experiences thus resembles in some respects divergent creative thinking, which involves generating creative ideas by combining diverse kinds of information in novel ways (Guilford, 1967). In light of this similarity, and the association of both divergent thinking and episodic simulation and memory with the default network, there is reason to suspect that episodic memory might contribute to divergent creative thinking. The results of several recent studies provide experimental support for this hypothesis.

Two lines of evidence support this idea, at least indirectly, by linking divergent thinking with the hippocampus, a structure that has long been thought to play an important role in episodic memory. Duff, Kurczek, Rubin, Cohen, and Tranel (2013) found that amnesic patients with severe impairments of episodic memory as a consequence of bilateral hippocampal damage are also impaired on the Torrance Tests of Creative Thinking, which provide a broad assessment of divergent thinking. Evidence from recent fMRI studies points in the same direction. As noted earlier, Ellamil et al. (2012) found that brain regions frequently associated with episodic memory, including the hippocampus, show increased activity when participants generate creative ideas while designing book cover illustrations. Benedek et al. (2014) reported that the hippocampus was among the regions that showed increased activation when participants performed a standard test of divergent thinking—the Alternate Uses Task (AUT), which requires generating alternative uses for common objects. Although consistent with a contribution of episodic memory to divergent thinking, these findings are not conclusive because (1) hippocampal amnesic patients typically exhibit deficits in forming new semantic memories, as well as new episodic memories (e.g., Eichenbaum & Cohen, 2001; Squire, Stark, & Clark, 2004), so it is difficult to determine conclusively whether the divergent thinking deficits in such patients, as reported by Duff et al. (2013), specifically implicate episodic memory; and (2) although activation in the hippocampus during creative idea generation and divergent thinking (Benedek et al., 2014; Ellamil et al., 2012) is broadly consistent with a role for episodic memory, such correlational observations do not provide conclusive evidence that episodic memory supports divergent thinking.

Behavioral evidence, however, points in the same direction. Healthy young adults occasionally draw on episodic memories when performing the AUT, primarily during the early phases of task performance (Gilhooly, Fioratou, Anthony, & Wynn, 2007). In a study of healthy young and older adults, Addis, Pan, Musicaro, and Schacter (2016) reported that performance on the AUT is positively correlated with the number of episodic

details that participants report when they imagine possible future experiences. However, this correlation with AUT performance was specific to imagined future events, and was not observed for imagined or recalled past events.

Madore, Addis, and Schacter (2015) provided a stronger link between episodic memory and AUT performance in experiments in which participants received an *episodic specificity induction*—brief training in recollecting specific details of a recent experience—prior to performing the AUT. The specificity induction used in this study is based on the well-established Cognitive Interview (CI; Fisher & Geiselman, 1992), a protocol used primarily in forensic contexts to increase episodic retrieval from eyewitnesses. When receiving the CI-based specificity induction, participants are encouraged to focus on episodic details pertaining to people, objects, and actions in a recently viewed video of an everyday scene (i.e., people performing actions in a kitchen setting). Several previous studies have shown that this specificity induction, compared with a control induction where participants provide their general impressions of a recently viewed video, selectively boosts the number of episodic details that participants provide on subsequent tasks that require remembering past experiences and imagining future experiences, while having no effect on the number of semantic details that participants provide on such tasks (Jing, Madore, & Schacter, 2016; Madore, Gaesser, & Schacter, 2014; Madore & Schacter, 2016; for review, see Schacter & Madore, in press).

In the study by Madore et al. (2015), specificity and control inductions were given prior to performance on two key tasks: the AUT and an object association task that required participants to generate common associates of objects but did not require divergent thinking. Critically, the specificity induction resulted in a significant increase in the number of appropriate uses that participants generated on the AUT, while having no effect on performance of the object association task. A second experiment compared effects of the specificity induction on AUT performance with performance of a task that taps convergent thinking, that is, the ability to generate the best single solution to a problem. To assess convergent thinking, Madore et al. (2015) used a remote associates test (RAT; Bowden & Jung-Beeman, 1998; Mednick, 1962), which requires participants to generate a solution word that forms a common word/phrase with each of the three main parts of a target word triad (e.g., for "Eight/Skate/Stick" the solution word is "Figure"). Results revealed that once again, the specificity induction significantly boosted performance on the AUT, but failed to produce a significant effect on the RAT.

Taken together, these findings suggest that episodic memory does make a contribution to creative cognition, but the contribution may be limited to divergent thinking. Schacter and Madore (in press) have argued that the specificity induction biases the way in which participants approach

cognitive tasks by encouraging them to focus on episodic details related to places, people, objects, or actions, which in turn impacts subsequent performance on those tasks that involve, at least to some extent, creating mental events or scenes that contain details like those emphasized during the specificity induction. By this view, a divergent thinking task, such as the AUT involves the creation of mental events or scenes as participants attempt to imagine novel ways in which a familiar object could be used, and the specificity induction may help participants to create or retrieve more detailed mental events that support the generation of novel uses. Although much remains to be learned about the relations among episodic memory, episodic simulation, and divergent thinking, and the extent to which they depend on the same or different regions within the default network, it seems clear that future research in the area of creative cognition should explore these relations more fully.

CONCLUSIONS AND FUTURE DIRECTIONS

The research described earlier highlights the contribution of self-generated thought and the default network to creativity. We propose that the cognitive processes associated with this network—namely, self-generated thought and episodic memory—play a central role in the production of creative ideas. This notion has received support from behavioral research showing consistent involvement of episodic memory in creative cognition, suggesting that the ability to draw upon and flexibly recombine memory representations reflects a core mechanism underlying creative thought. Recent work also implicates cognitive control processes in creativity, particularly when idea production must be constrained to meet specific creative goals (Beaty et al., 2016b). Taken together, we conclude that creative thought can benefit from both goal-directed and self-generated thought.

An important direction for future neuroimaging research is to determine which aspects of self-generated thought are relevant for creative cognition. As noted earlier, self-generated thought can involve spontaneous cognition (e.g., mind-wandering; Smallwood, 2013), but the extent to which creativity actually benefits from such spontaneous processes remains unclear. Notably, recent behavioral research suggests that mind-wandering may hinder creative idea production (Hao, Wu, Runco, & Pina, 2015). In this context, the default network's involvement in creativity might not reflect spontaneous thought per se, but rather the operation of some other process, such as episodic memory (Schacter et al., 2012). Future neuroimaging research could employ experimental paradigms designed to disentangle the complex relationship between creativity and the default network. For example, the episodic specificity induction described earlier (Madore et al., 2015) could be employed in fMRI experiments to

determine whether episodic memory accounts for patterns of default activity during creative cognition.

Future research should also further delineate the contribution of cognitive control in creative thought. Based on the evidence described earlier, we propose that creativity may benefit from control processing in contexts where idea generation is constrained to meet task-specific goals (Beaty et al., 2016b). For example, Pinho et al. (2016) reported increased cooperation of control and default network regions when pianists improvised melodies based on a predefined emotion. Thus, cognitive control may be beneficial when people attempt to tailor their ideas to fit the demands of a predefined creative problem. Nevertheless, although both cognitive control and self-generated thought appear to be important for creativity, understanding how these networks interact to support complex creative behaviors remains an open and interesting question for future research.

Acknowledgments

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Individual Difference Correlates of Self-Perceptions of Creativity

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This chapter reviews studies that have investigated the relationships between self-perceptions of creativity and the individual difference constructs of cognitive ability and personality. The chapter has six broad sections. First, we define the key constructs under investigation. Second, we provide an organizing framework by which we classify creative self-perceptions and structure the chapter. Third, we provide the key theories for interpreting the studies. Fourth, we present the main trends from the review. Fifth, we discuss some of the more nuanced findings. Sixth, we provide conclusions and present explanatory models based on our review that we believe can guide future research.

DEFINING CREATIVITY

No single description of creativity is universally favored by the field (Batey, 2012). However, most definitions suggest that creativity is the tangible manifestation of a product (e.g., idea, design, artifact) considered *new* and *useful* by an appropriate person or persons (Batey & Furnham, 2006). Herein lies the first challenge for this chapter: self-perceptions of creativity do not correspond with common definitions of creativity. This is due to the lack of a perceptible product that, conspicuous by its absence, cannot be subject to external validation regarding the extent to which it is perceived to be novel or useful. Therefore, we require a dedicated definition of self-perceptions of creativity that does not focus on tangible products, novelty, or utility. We proffer the following as a definition of self-perceived creativity:

> Personal assessments concerning the extent to which an individual identifies themselves to possess the traits and processes required to produce products they consider to be creative as well as perceptions regarding the environments they feel induce creativity.

It should be noted that this new definition of self-perceived creativity is similar to that proffered for mini-C creativity (Kaufman & Beghetto, 2009), but differs in that the new definition offered here conforms to the 4P's approach and suggests that self-perceived creativity could also include self-assessments of creativity-inducing environments.

While self-perceptions of creativity are clearly not synonymous with creative output, there is a growing body of evidence demonstrating that they reliably predict creative potential, effort, and achievement (e.g., Ames & Runco, 2005; Hughes, Furnham, & Batey, 2013; Plucker, Runco, & Lim, 2006; Putwain, Kearsley, & Symes, 2012). As Hughes et al. (2013, p. 76) put it:

> Self-assessments of our abilities influence what we attempt to do and how much effort we expend (Deci & Ryan, 2000; Haimovitz, Wormington, & Corpus, 2011); often serving as self-fulfilling prophesies (Judge, 2009). Thus, what one believes they are capable of doing is directly linked to what one will do and resultantly what one can achieve.

DEFINING INDIVIDUAL DIFFERENCES

Human beings share a great deal; we all have heads, hearts, and (contrary to some anecdotal evidence) brains. However, each human being is also unique. Individual differences psychology is devoted to the study of characteristics, such as cognitive abilities, personality, motivation, values, and self-concept that produce this uniqueness (Furnham, 2008). This chapter focuses on the individual difference traits of cognitive ability and personality, first, because they are the most well-established individual difference constructs (Furnham, 2008) and, second, because there is scant research regarding creative self-perceptions and other individual differences (cf., Batey & Furnham, 2006).

No unequivocal definition of personality exists, but certain features are agreed (Hughes & Batey, 2017). These are perhaps best captured by the view that personality "refers to an individual's characteristic patterns of thought, emotion, and behavior, together with the psychological mechanisms—hidden or not—behind those patterns" (Funder, 2004, p. 5). The vast majority of studies of self-perceptions of creativity and personality have referenced the Big Five personality traits (see Digman, 1990, for historical overview). A more detailed exposition of models of personality and their relations with different measures of creativity can be found in Batey and Furnham (2006). The Big Five model posits five broad personality "factors"—Openness to Experience/Intellect, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Costa & McRae, 1992)—which subsume 10 "aspects" of personality (DeYoung, Quilty, & Peterson, 2007) and are further subdivided into 30 personality "facets" (Table 11.1). The Big Five

TABLE 11.1 Big Five Personality Factors, Aspects, and Facets

Level of Hierarchy	Factor Label				
Big 5 Factor	Neuroticism/Emotional Stability	Extraversion	Openness to Experience/Intellect	Agreeableness	Conscientiousness
Aspects[a]	Volatility Withdrawal	Enthusiasm Assertiveness	Intellect Openness	Compassion Politeness	Industriousness Orderliness
Facets[b]	Anxiety Angry Hostility Depression Self-Consciousness Impulsiveness Vulnerability	Warmth Gregariousness Assertiveness Activity Excitement-Seeking Positive Emotions	Fantasy Aesthetics Feelings Actions Ideas Values	Trust Straightforwardness Altruism Compliance Modesty Tender-Mindedness	Competence Order Dutifulness Achievement Striving Self-Discipline Deliberation

[a]*Adapted from DeYoung et al. (2007).*
[b]*Adapted from Costa and McRae (1992).*

is not immune to criticism on theoretical, measurement, and predictive capability grounds (cf., Block, 2010; Hughes & Batey, 2017); it is also not the only omnibus model, with others, such as the six-factor HEXACO, recently gaining traction.

Cognitive ability may be defined as a "mental capability that … involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience" (Gottfredson, 1997, p. 13). This chapter examined studies that have measured cognitive ability using tests of general intelligence (g), fluid intelligence (gf), and crystallized intelligence (gc). It is beyond the scope of this chapter to critique and fully explain these different aspects of cognitive ability, but more detailed information can be found in Schneider and McGrew (2012). In brief, measures of g (which may be referred to as Intelligence, IQ, or General Mental Ability) assess an individual's broad cognitive abilities, while measures of gf and gc assess speed of information processing and the use of skills and knowledge, respectively.

AN ORGANIZING STRUCTURE FOR THE CHAPTER

Creativity has been studied from a multitude of angles that make the field rich and diverse, but often lacking in coherence. The same is true of the study of self-perceptions of creativity. Thus, in order to provide some structure to this literature, we make use of Batey's (2012) heuristic framework (Fig. 11.1), which draws together Rhodes' (1987) 4P's of creativity, Amabile's (1996) three levels of creativity, and Anastasi and Urbina's (1997) objective/subjective assessment model. Batey's (2012) framework acknowledges that creativity is not a single construct, but rather the
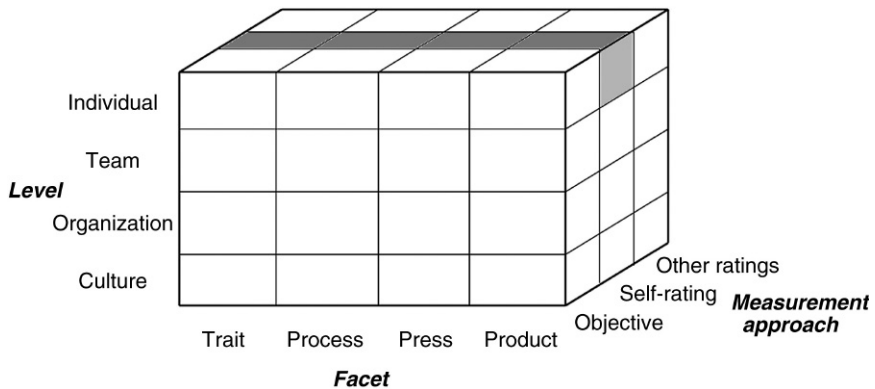
FIGURE 11.1   An outline of the scope of this chapter in accordance with Batey's (2012) Measurement Heuristic for Creativity.

product of a process undertaken by a person or persons within an environment (press). Self-perceptions of each of these elements might be important and although correlated are likely to be, at least to some extent, unique. It is easy to imagine that a person may believe that they have created several useful and novel products without seeing themselves as a creative person. Equally, one might believe they follow creative processes, but do not generate creative products. Thus, separating out these different elements can provide us with more nuanced information regarding the nature of self-perceptions and their individual difference correlates. Our earlier definition is in accordance with this framework and our approach will allow us to identify relationships that go beyond the simple correlations between individual differences and broad self-perceptions.

This chapter focuses at the *level* of the individual utilizing self-ratings or self-perceptions (*measurement approach*) of the traits, processes, and products, *facets* of creativity. This chapter cannot consider relationships between individual differences and perceptions of creativity-inducing environments (press), because such studies do not exist. Although assessments of environments fall outside of the classical view of self-perceptions, it is clearly the case that if a person believes their environment to be stifling, then this will have an impact on their satisfaction, motivation, and performance. We believe this to be an important gap for future research to address. The studies reported here cover a similar territory to the recent meta-analysis of Karwowski and Lebuda (2016), but with a deliberate effort to carefully delineate self-perceptions into traits, process, and product measures, allowing us to describe more nuanced relationships.

LITERATURE SEARCH

In preparation for this chapter, we conducted a systematic review of the literature. First, databases were searched for the terms "creat*," "intelligence," "cognitive ability," "general mental ability," "personality," and "traits" in the title or keywords of published studies. Second, abstracts of papers returned by these search criteria were scrutinized to find studies that examined individual creativity self-perceptions and ability and/ or the Big Five. Third, we extracted the required data. Often, the data of interest for this chapter were not the primary focus of the original study and the analyses used varied statistical approaches (e.g., bivariate correlations, regressions, factor analyses, and structural equation models), making strict comparisons regarding the magnitude of effect sizes problematic. However, by collating data from a broad array of sources and organizing them according to Batey's (2012) framework, it is hoped that this chapter will lead to a systematic understanding of the individual difference correlates of different elements of creative self-perceptions.

MEASURES OF CREATIVE SELF-PERCEPTIONS

The literature search returned a large number of studies and a wide array of self-perception measures, each of which we were able to classify as a measure of a trait, process, or product (Batey, 2012; Table 11.2). Self-perceived creativity traits were captured by self-rated creativity, creative self-efficacy, creative personality, and creative personal identity. Self-perceived creative processes were examined only by the Runco Ideational Behavior Scale. Self-perceived creative products focused on ratings of tangible products, and also creative performance or competence. It is our rationale that to rate oneself as competent in the area of scientific or artistic creativity, one must have generated a product. For this review, we differentiated self-reported creative product measures into two categories: those measures or studies that provide a single "score" pertaining to the creative product or achievement and those measures that are multidimensional. Note that this dichotomy is somewhat forced, in that some multidimensional measures can be summed to produce a single score. For this chapter we were restricted to interpreting the data dependent on how the original researchers had decided to score each creative achievement measure.

Table 11.2 lists each of the self-perceived creativity measures referenced in this chapter. It is fair to observe that there still exists some confusion as to the interrelations between these different individual self-perception constructs and what data there are suggest considerable overlap (Karwowski, Lebuda, Wisniewska, & Gralewski, 2013). That there are so many different assessments of individual creative output would suggest a need for integration and rationalization.

SPOILER ALERT: THE KEY TRENDS—THE POWER OF OPENNESS TO EXPERIENCE AND EXTRAVERSION

It is customary to leave the overall summary of the key relationships explored in a comprehensive review to the end—the "big reveal." In this case, we have decided to do the opposite allowing the remaining sections to focus on the nuanced findings related to traits, processes, and products.

The clear trend, across self-perceived creativity traits, processes, and products, is that there is a positive and significant relationship with Openness to Experience and Extraversion (Tables 11.3 and 11.4). This finding is in accordance with studies that have examined creativity as assessed through measures of divergent thinking as well as real-world achievement (Batey & Furnham, 2006; Batey, Rawles & Furnham, 2009; Feist & Barron, 2003; Gelade, 1997). Thus, people perceive their personal creativity to be founded upon their tendency to be open to aesthetic experiences, imaginative and reflective (Openness), as well as their tendency to enjoy

TABLE 11.2 Construct, Definition, and References for the Self-Perceived Creativity Measures Reported in This Chapter

Facet	Construct	Definition	References
Trait	Self-rated creativity	The extent to which an individual considers themselves to possess creative abilities	Self-rated creativity: Batey, M. (2007). *A psychometric investigation of everyday creativity*. London: University College London. Unpublished doctoral thesis; Kandler et al. (2016); Marsh, Trautwein, Lüdtke, Köller, and Baumert (2006)
	Creative self-efficacy	The extent to which an individual possesses self-belief in their ability to produce creative outcomes	Creative self-efficacy: Beghetto (2006); Karwowski, Lebuda, and Wisniewska (in press); Tierney and Farmer (2002)
	Creative Personality	The extent to which an individual perceives themselves to possess personality traits relating to creative talent	Creative Personality Scale: Gough (1979)
	Creative personal identity	The extent to which an individual places importance of being creative in their self-image	Creative personal identity: Karwowski et al. (2012)
Process	Ideational behavior	The extent to which an individual perceives themselves to possess the behaviors associated with creative cognition	Runco Ideational Behavior Scale: Runco, Plucker, and Lim (2000–2001)
Product	Creative achievement	The extent to which an individual perceives themselves to have achieved in creative domains	The Activities and Accomplishments Inventory (AII): Hong, E., & Milgram, R. M. (2009). Activities and accomplishments inventory;. Las Vegas, Ramat-Aviv, Israel: College of Education, University of Nevada, School of Education, Tel-Aviv University. Unpublished instrument. Biographical Inventory of Creative Behaviours (BICB): Batey (2007, unpublished). Creative Achievement Questionnaire (CAQ): Carson, Peterson, and Higgins (2005). Creative Behavior Inventory (CBI): Dollinger (2003). Creative Domains Questionnaire (CDQ): Kaufman (2006). Creative Domains Questionnaire-Revised (CDQ-R): Kaufman, Cole, and Baer (2009). Inventory of Creative Accomplishments and Achievements (ICAA): Jauk, Benedek, and Neubauer (2014). Kaufman Domains of Creativity Scale (K-DOCS): Kaufman (2012)

TABLE 11.3   Relationships Between Self-Perceived Creativity and Measures of Personality

Self-Perceived Creativity	References	Personality Measure	Sample (*n*), Country	Analysis	Finding				
					N	E	O	A	C
Trait—SRC	Kandler et al. (2016)	NEO-FFI + NEO-PI-R	Adults (600 + 844), Germany	Average Correlations	−0.16**	0.25**	0.26**		0.10**
Trait—SRC	Furnham et al. (2013)	NEO-FFI	Adults (207), United Kingdom	Correlations		0.23***	0.36***		
Trait—SRC	Furnham et al. (2011)	NEO-FFI	Students (108 + 90), United Kingdom	Average Correlations			0.44**		
Trait—SRC	Batey et al. (2010a, 2010b)	TIPI	Students (100), United Kingdom	Correlations	−0.20**		0.46**		
Trait—SRC	Furnham et al. (2008)	NEO-FFI	Students (128), United Kingdom	Correlations		0.35***	0.36***		
Trait—SRC	Furnham and Bachtiar (2008)	NEO-FFI	Mixed (176), United Kingdom	Correlations		0.17*			
Trait—SRC	Furnham, Zhang, and Chamorro-Premuzic (2006)	NEO-PI-R	Students (64), United Kingdom	Correlations		0.30*			
Trait—SRC	Marsh et al. (2006)	NEO-FFI	Adults (207), Germany	Correlations		0.23***	0.36***		
Trait—CSE	Hong, Peng, and O'Neill (2014)	SAQ	Students (256), China	Correlations			0.23***		0.69**
Trait—CSE	Pretz and McCollum (2014)	IPIP	Students (90), USA	Correlations	0.33*	0.50**	0.70**		

Trait—CSE	Karwowski et al. (2013)	BFI-10	Adults (2674), Poland	Correlations	−0.33***	0.14***	0.34***	−0.09***	0.19***
Trait—CSE	Hsu, Hou, and Fan (2011)	NEO-FFI	Adults (340), Taiwan	Correlations		0.30**	0.71**	0.39**	0.61**
Trait—CPS	Sánchez-Ruiz, Hernández-Torrano, Pérez-González, Batey, and Petrides (2011)	GPA	Students (175), Spain	Correlations		0.25**	0.51**		
Trait—CPS	Burch, Hemsley, Pavelis, and Corr (2006)	NEO-FFI	Students (100), United Kingdom	Correlations	−0.23*	0.31*	0.25*		
Trait—CPI	Karwowski et al. (2013)	BFI-10	Adults (2674), Poland	Correlations	−0.20***	0.17***	0.37***	−0.07***	0.16***
Process—RIBS	Batey et al. (2010a, 2010b)	NEO-PI-R	Students (158), United Kingdom	Regressions		0.22**	0.49**		−0.38**
				Facet-Level Regressions	N2 Angry Hostility: $\beta = 0.27*$ N6 Vulnerability: $\beta = -0.30*$		O2 Aesthetics: $\beta = 0.38**$ O5 Ideas: $\beta = 0.33**$		C6 Deliberation: $\beta = -0.37**$
Product—BICB	Chen (2016)	HEXA-CO-60	Students (202), China	Correlations		0.19**	0.30***		0.16*

(*Continued*)

TABLE 11.3   Relationships Between Self-Perceived Creativity and Measures of Personality (*cont.*)

Self-Perceived Creativity	References	Personality Measure	Sample (*n*), Country	Analysis	Finding				
					N	E	O	A	C
Product—BICB	Furnham et al. (2013)	NEO-FFI	Adults (207), United Kingdom	Correlations		0.25***	0.38***		
Product—BICB	Furnham et al. (2011)	NEO-FFI	Students (108 + 90), United Kingdom	Average Correlations			0.35**		
Product—BICB	Batey et al. (2010a, 2010b)	TIPI	Students (100), United Kingdom	Correlations			0.33**		
Product—BICB	Furnham et al. (2008)	NEO-FFI	Students (128), United Kingdom	Correlations		0.34***	0.38***		
Product—BICB	Furnham and Bachtiar (2008)	NEO-FFI	Mixed (176), United Kingdom	Correlations		0.41**			
Product—BICB	Marsh et al. (2006)	NEO-FFI	Adults (207), United Kingdom	Correlations		0.25***	0.38***		
Product—CAQ	Silvia, Nusbaum, Berg, Martin, and O'Connor (2009)	NEO-FFI, IPIP, TIPI	Students (189), USA	Regressions			0.48***		
Product—CAQ	Pretz and McCollum (2014)	IPIP	Students (90), USA	Correlations		0.26*	0.48***		
Product—CBI	Silvia et al. (2009)	NEO-FFI, IPIP, TIPI	Students (189), USA	Regressions			0.62***		

Product— CDQ-R	Chen (2016)	HEXA-CO-60	Students (202), China	Correlations		0.34***	0.53***		0.35***
Product— CDQ-R	Werner, Tang, Kruse, Kaufman, and Spörrle (2014)	SIMP	Students (787), China	Correlations			0.20***		
Product— ICAA, Activities	Jauk et al. (2014)	BFSI	Adults (297), Germany	SEM			0.48***		

A, Agreeableness; *BFI-10*, Big Five Inventory (Rammstedt & John, 2007); *BFSI*, Big-Five Struktur Inventar (Arendasy, Sommer, & Feldhammer, 2011); *BICB*, Biographical Inventory of Creative Behaviours; *C*, Conscientiousness; *CAQ*, Creative Achievement Questionnaire; *CBI*, Creative Behaviors Inventory; *CDQ-R*, Creative Domains Questionnaire—Revised; *CPS*, Creative Personality Scale; *CSE*, Creative self-efficacy; *E*, Extraversion; *GPA*, Goldberg's Bipolar Adjectives (Goldberg, 1992); *HEXACO-60*, HEXACO Personality Inventory (Ashton & Lee, 2009); *ICAA*, Inventory of Creative Activities and Achievements; *IPIP*, International Personality Item Pool (Goldberg, 1992); *N*, Neuroticism; *NEO-FFI*, NEO Five Factor Inventory; *NEO-PI-R*, NEO Personality Inventory Revised; *O*, Openness to Experience; *RIBS*, Runco Ideational Behavior Scale; *SAQ*, Self-Assessment Questionnaire [Hong, E. (2001). *Self-assessment questionnaire (SAQ): Intrinsic motivation*. Las Vegas, NV: College of Education, University of Nevada. Unpublished document]; *SEM*, Structural Equation Model; *SIMP*, Single-Item Measure of Personality (Woods & Hampson, 2005); *SRC*, Self-rated creativity; *TIPI*, Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003)
* P < 0.05.
** P < 0.01.
*** P < 0.001.

engaging in intellectual pursuits, being quick-witted and open to different ideas (Intellect). Concerning Extraversion, the positive association suggests that individuals perceive their creativity to be based on their friendliness, warmth, and sociability (Enthusiasm) in addition to their perceived tendency to be leader-like, assertive, and provocative (Assertiveness). There are few facet or aspect-level studies of personality with measures of self-perceived creativity so it is difficult to say with certainty which are most strongly related. However, these four aspects of personality (Openness to Experience, Intellect, Enthusiasm, and Assertiveness) may point toward different social and cognitive processes that people perceive to drive their creativity.

Openness to Experience

Open individuals tend to try new things, absorb more ideas, and consider alternate perspectives that provide a greater knowledge base with which to generate new and novel ideas (e.g., Campbell, 1960; Finke, Ward, & Smith, 1992; Jung, Mead, Carrasco, & Flores, 2013; Mednick, 1962). The two aspects of Openness concern aesthetic interests (Openness) and intellectual stimulation (Intellect). The aesthetic component inclines people to engage in the arts and sensory experiences and perhaps as a result creating a self-concept that they are "arty" and arty people are creative. Intellect may have multiple influences. First, it might admit people to consciously question existing beliefs and paradigms (e.g., problem finding; Okuda, Runco, & Berger, 1991) in order to identify opportunities to be creative. Second, it will also assist in the development of extensive general and domain-specific knowledge (Ackerman, 1996) that, if used in combinatorial processes of creative cognition (Batey, Furnham, & Safiullina, 2010), will result in novel ideas. Third, heightened Intellect is associated with enjoyment of deliberate and sustained engagement in cognitively complex thought (e.g., philosophical, scientific, political debate; DeYoung et al., 2007), and, thus, may facilitate the identification of nonobvious problem solutions, akin to the role played by intrinsic motivation in facilitating creativity (Amabile, 1996). In short, those who are Open are more likely to be creative and on the basis of our review, they are also likely to know it.

Extraversion

Extraversion subsumes two aspects of personality, namely, Enthusiasm and Assertiveness. Enthusiasm may indicate that self-perceptions of personal creativity necessitate a role for collaboration, networking, and interaction. These socially oriented behaviors are vital when an individual wishes to engage their creative output in the real world (Gelade, 1997). Furthermore, Enthusiasm may help individuals choose to engage in

particular creative activities (i.e., group-based drama) as opposed to primarily individual activities that are often perceived as less creative (e.g., Math). Assertiveness may allow individuals to go against convention and promote their creative ideas (Helson, 1967), and, in turn, receive feedback (without feedback can one know if their ideas are truly novel?). An additional explanation may be that extraverts have a tendency to provide more positive self-ratings, regardless of the domain (Hughes et al., 2013).

SELF-PERCEIVED CREATIVITY, NEUROTICISM, AGREEABLENESS, AND CONSCIENTIOUSNESS

The findings from studies that have examined the relationships between personality and self-perceived creativity are presented in Table 11.3 and follow Batey's (2012) framework organizing measures according to whether they assess traits, processes, or products.

Trait

When creativity is assessed as a trait-based self-rating, the role of Openness to Experience and Extraversion remains, but there are occasional negative relationships with Neuroticism and positive relationship with Conscientiousness.

It is likely that the negative relationship with Neuroticism can partially be explained by the reduced self-esteem and confidence of those high in Neuroticism that leads them to understate their abilities. Furthermore, higher levels of positive affect and reduced general anxiety and social anxiety (negative Withdrawal) may be perceived to facilitate creativity, insofar as positive emotions have been found to increase divergent thought production (Baas, De Dreu, & Nijstad, 2008), while reduced anxiety and social anxiety would allow individuals to challenge perceptions and take risks as well as share ideas collaboratively (Dewett, 2007). However, this "calm" perspective of relevant creativity traits is at odds with the finding that self-perceived artistic creativity is allied to impulsivity and aggression (Hughes et al., 2013). It might be that domain-specific differences can be observed here; there are consistent findings that there is an "artistic" as well as "scientific" conception of creativity (Furnham, Batey, Booth, Patel, & Lozinskaya, 2011; Kaufman et al., 2016; Snow, 1963). Therefore, when an individual is asked to provide an overall trait self-rating, they may reference their conception of artistic creativity, scientific creativity, or a mixture of both.

A number of studies found a positive and significant relationship ($r = 0.10–0.69$) between self-rated creativity and Conscientiousness. It is possible that some studies did not return this finding because the relationship is weak and is therefore only found in studies with a large sample

(those reporting the correlation, $n = 256–2674$). Furthermore, Conscientiousness facets may demonstrate differential relationships with self-perceptions of creativity. The Orderliness aspect, concerned with order and perfectionism, is either unrelated (Furnham, Hughes, & Marshall, 2013) or negatively related to creativity (Feist, 2010; Reiter-Palmon, Illies, & Kobe-Cross, 2009) probably because it is linked with rigidity and inflexibility. In contrast, the Industriousness aspect, concerned with purposefulness, sense of competence, and self-discipline, may be positively related due to its links with perseverance and self-belief. Indeed, the self-belief or self-esteem mechanism may be at work again as contrary to Neuroticism; those high in Conscientiousness tend to have high self-esteem (perhaps due to the fact that they complete projects). Indeed, three of the four significant correlations observed concerned creative self-efficacy. A further intrigue relates to possible cultural differences. Two of the Conscientiousness correlations are observed within "East Asian" samples (China and Taiwan) and these are also the largest correlations. It is possible that "Eastern" creative self-perceptions are more closely related to Industriousness and Orderliness (the Conscientiousness aspects) than are "Western" self-perceptions. Further aspect- and facet-level studies are required to understand this distinction further.

Agreeableness is generally unrelated to self-perceptions. However, there are two very modest negative correlations and one positive correlation. The negative associations are observed in European samples and the one negative correlation in a Taiwanese sample. It is possible that cross-cultural effects are evident. Perhaps Disagreeableness (argumentative) is perceived to be desirable for creativity in Individualist cultures but Agreeableness (collaboration, teamwork) is seen as key to creativity in Collectivist cultures (Morris & Leung, 2010; Oyserman, Coon, & Kemmelmeier, 2002). Further research is needed to examine such possibilities.

Process

Just a single study examined personality and self-perceptions of the creative process and revealed positive correlations with Openness to Experience and Extraversion, a negative correlation with Conscientiousness, and nuanced relationships with Neuroticism. The negative relationship with the Deliberation facet of Conscientiousness in addition to the positive relationship with Angry Hostility (Neuroticism) suggests that self-perceived strength in the creative process is allied to an element of impulsivity, be it impulsivity that would arise from not planning and deliberating, or emotional impulsivity in the context of spontaneous expression of negative emotions (see also Hughes et al., 2013). In fact, it might be contended that self-reported creative process is partly founded on self-beliefs that the individual has chaotic and disordered thinking process as found in studies that have examined mild forms of psychopathology such as schizotypy (Batey &

Furnham, 2008) or hypomania (Furnham, Batey, Anand, & Manfield, 2008). The results of this one study (Batey, Chamorro-Premuzic, & Furnham, 2010) are very useful due to their facet-level exploration; however, it is only a single study and interpretations should be made cautiously. More research concerning self-perceptions of the creative process is needed.

Product

The personality traits associated with single score, domain-general, self-perceived creative achievement paint a consistent picture (Table 11.3) as Openness to Experience and Extraversion are the largest correlates and there may be a culturally situated contribution for Conscientiousness. However, the correlations for Extraversion with creative achievement appear to be greater than those observed for self-rated traits and the creative process. This may be because one can perceive oneself to be highly creative or have a creative thinking style, but genuine production (e.g., the sharing of ideas) requires some degree of socialization, collaboration, or interaction with others. Furthermore, many of the items for self-reported achievement necessarily include inherently social behaviors: drama, sports, leadership, and so on. The heightened social nature of these activities perhaps leads to a more prominent role for Extraversion, in particular the Enthusiasm aspect. The findings for Conscientiousness are again intriguing. One study found positive and significant relationships between Conscientiousness and self-perceived creative achievement (Chen, 2016). First, it is surprising that this relationship is not observed more frequently, given that job performance and achievement in everyday domains is often strongly associated with Conscientiousness (Dudley, Orvis, Lebiecki, & Cortina, 2006). Perhaps the reason for the absence of this consistent positive relationship is that in self-reported achievement there is no judgment of quality of the achievement. Second, whereas most studies use "Western" samples, the sample for Chen (2016) was Chinese. Much as observed earlier, it may be the case that self-perceptions of creative achievement in "East Asian" cultures are more closely related to hard work and making something useful (Conscientiousness), whereas "Western" cultures emphasize ideas and novelty (Openness) (Morris & Leung, 2010).

The personality correlates for multidimensional measures of self-perceived creative achievement are presented in Table 11.4. Again, Openness to Experience is a consistent predictor, except for Entrepreneurship, where a significant negative relationship is observed. It is possible that this may be explained by the need for entrepreneurs to be action-oriented, rather than thinking-oriented as may be inferred of the behavior of those high on Openness to Experience (Costa & McRae, 1992). It could also be an outlier given that the sample was made up of students who have likely had little experience of entrepreneurship.

TABLE 11.4   Relationships Between Multidimensional Self-Perceived Creative Products and Personality

References	Achievement Measure	Personality Measure	Sample (n), Country	Analysis	Achievement Facet	Finding				
						N	E	O	A	C
Hong et al. (2014)	AAI	SAQ	Students (256), China	Correlations	Music			0.08*		
					Visual Arts			0.13***		
					Creative Writing			0.11**		
Kaufman et al. (2016)	CAQ	BFAS	Adults (1035), USA	Correlations	Visual Arts			0.18***		
					Music			0.19***		
					Creative Writing			0.31***		
					Humor		0.22***			
					Inventions			0.15***		
					Scientific Discovery			0.21***		
					Theater/Film		0.17***	0.19***		
Kaufman et al. (2009)	CDQ	IPIP	Adults (182), USA	Correlations	Math/Science	−0.013*		0.25**		
					Drama		0.43**	0.37**	0.16*	
					Interaction	−0.24**	0.36**	0.29**	0.21**	
					Arts		0.27**	0.28**	0.22**	
Davis, Kaufman, and McClure (2011)	CDQ	IPIP	Students (266), USA	Regressions	Entrepreneur	−0.032**		−0.32**		
					Math/Science				−0.38**	
					Interpersonal		0.32**			
					Artistic-Verbal		0.44**			
					Artistic-Visual	−0.24*	0.23*			
					Performance		0.56*			

A, Agreeableness; *AAI*, Activities and Accomplishments Inventory; *BFAS*, Big Five Aspect Scales; *C*, Conscientiousness; *CAQ*, Creative Achievement Questionnaire; *CDQ*, Creative Domains Questionnaire; *E*, Extraversion; *IPIP*, International Personality Item Pool; *N*, Neuroticism; *O*, Openness to Experience; *SAQ*, Self-Assessment Questionnaire.
* P < .05.
** P < .01.
*** P < .001.

There are significant and positive correlations to be observed for Extraversion, with correlations often higher for domains that involve greater social interaction such as Humor, Theater/Film, Drama, Interpersonal, and Performance domains. It should be noted that positive and significant relationships are also observed for artistic domains in three studies. A similar finding, though not so prominent, was observed for Agreeableness. Positive relationships for Agreeableness were observed for Drama, Interaction, and the Arts, where it may be hypothesized that aspects pertaining to Compassion and Politeness may facilitate positive relationships and collaboration and therefore creative achievement. A negative relationship was observed for Math/Science, where it may be contended that not only interpersonal interaction is less important but, for the case of mathematics especially, working independently may also be beneficial for concentration and focus.

A significant and negative relationship of Neuroticism to creative achievement was also observed. It is possible that there are two mechanisms at play. The negative relationship between Neuroticism and Entrepreneurship may be related to lower social anxiety facilitating creative achievement in these interpersonally related domains. As we discussed earlier, Neuroticism is negatively related to self-perceptions of creativity in terms of being a creative person and having creative self-efficacy. In turn, these negative self-perceptions are likely to lead to reduced effort in creative domains and reduced willingness to disseminate creative ideas, thus serving as a self-fulfilling prophecy in reducing entrepreneurial output.

SELF-PERCEIVED CREATIVITY AND COGNITIVE ABILITY

This section provides a detailed account of studies that have examined the relationship between measures of self-perceived creativity and cognitive ability (Table 11.5).

Traits

When self-perceived creativity is assessed as a global, domain-general, trait, there is very rarely a relationship with cognitive ability (Table 11.5). Thus, perceptions that an individual considers themselves to be creative are unrelated to their cognitive abilities. This is contrary to what is found when creativity is assessed in performance measures such as divergent thinking tests where, dependent on how the test is scored and the data modeled, correlations are commonly in the order of $r = 0.20$–0.50 (e.g., Batey & Furnham, 2006; Nusbaum & Silvia, 2011). There are three potential explanations behind this finding. First, and perhaps most likely, it might

TABLE 11.5 Relationships Between Self-Perceived Creativity and Measures of Cognitive Ability

Self-Perceived Creativity	References	Ability Measure	Sample (*n*), Country	Analysis	Finding
Trait—SRC	Kandler et al. (2016)	*g*	Adults (600 + 844), Germany	Correlations, CFA	ns
Trait—SRC	Batey et al. (2010a, 2010b)	*gf*; *gc*	Students (100), United Kingdom	Regressions	ns
Trait—SRC	Batey and Furnham (2009)	*g*	Students (140), United Kingdom	Correlations, Regressions	ns
Trait—SRC	Furnham and Bachtiar (2008)	*g*	Students (176), United Kingdom	Correlations, Regressions	ns
Trait—SRC	Furnham et al. (2008)	*gf*	Students (128) United Kingdom	Correlations, Regressions	ns
Trait—SRC	Furnham et al. (2006)	$2 \times gf, g$	Students (64), United Kingdom	Correlations, Regressions	ns
Trait—CPS	Sánchez-Ruiz et al. (2011)	*g*	Students (175), Spain	Correlations, Regressions	ns
Trait—CPS	Batey and Furnham (2009)	*g*	Students (140), United Kingdom	Correlations, Regressions	ns
Trait—CPS	Burch et al. (2006)	*g*	Students (100), United Kingdom	Correlations	$r = 0.24$**
Process—IB	Batey et al. (2010a, 2010b)	*g, gf*	Students (158), United Kingdom	Correlations	*g*: r = ns *gf*: $r = 0.19$*
Product—BICB	Batey et al. (2010a, 2010b)	*gf, gc*	Students (100), United Kingdom	Correlations, Regressions	ns
Product—BICB	Batey and Furnham (2009)	*g*	Students (140) United Kingdom	Correlations, Regressions	ns
Product—BICB	Furnham and Bachtiar (2008)	*g*	Adults (176), United Kingdom	Correlations, Regressions	ns
Product—BICB	Furnham et al. (2008)	*gf*	Students (128), United Kingdom	Correlations, Regressions	ns

Product—CAQ	Kaufman et al. (2016)	g	Adults (1035), USA	Correlations	Scientific Discovery: $r = 0.27$***
Product—CAQ	Kaufman (2013)	g	Adolescents (146), USA	Regressions	Scientific Discovery: $\beta = 0.50$* Culinary Arts: $\beta = -0.35$*
Product—ICAA	Jauk et al. (2014)	g	Adults (297), Germany	SEM	Creative Activities: $\beta =$ ns Creative Achievement: $\beta = 0.32$***

BICB, Biographical Inventory of Creative Behaviours; *CAQ*, Creative Achievement Questionnaire; *CFA*, Confirmatory Factor Analysis; *CPS*, Creative Personality Scale; *g*, General intelligence; *gc*, Crystallized intelligence; *gf*, Fluid intelligence; *IB*, Ideational Behavior; *ICAA*, Inventory of Creative Activities and Achievements; *ns*, nonsignificant; *SEM*, Structural Equation Model; *SRC*, Self-rated creativity.
P < 0.05.
**P < 0.01.*
***P < 0.001.*

be the case that lay perspectives of "creative" bear little relationship to perceptions of "intelligent." For example, Hughes et al. (2013) conducted a factor-analytic examination of self-ratings of numerous characteristics and found that self-ratings of trait creativity clustered with self-rated visual-artistic and verbal-artistic creativity, while self-rated intelligence clustered with self-rated problem solving, knowledge, and scientific creativity. Thus, self-perceived domain-general creativity is commonly associated with "the Arts" and even emotionality, but not with intellectually related traits. Therefore, individuals high in cognitive ability might not perceive their elevated problem-solving skills and idea generation to be "creative." Second, the samples for the nine studies reviewed were primarily student-based and thus there was a restriction of range in cognitive ability scores. It may also be hypothesized that in adult samples where there has been a greater opportunity to both succeed and fail in creative endeavors, there may be a greater awareness of the role of cognitive abilities in that success or failure. Third, the correlations we unearthed concerned self-rated creativity and the Creative Personality Scale (Gough, 1979) but not creative self-efficacy or creative personal identity. It is possible that these scales might be more strongly related to cognitive ability.

Process

Self-perceived creative processes are positively and significantly related to fluid intelligence. The positive correlation of fluid intelligence with Ideational Behavior is relatively easily explained. People who are high in fluid intelligence are able to rapidly process information and adapt to novel environments both of which require fluent, original, flexible, and elaborate thought processes. Thus, much like with Openness to experience, it is likely that those who are high in fluid intelligence are more creative (Batey & Furnham, 2006) and are reasonably accurate in spotting this.

Product

When self-perceived creative production is assessed as a single summed score, there are rarely significant correlations with measures of cognitive ability. A closer examination reveals a clear trend. Everyday creative achievement as assessed via a summed score is unrelated to cognitive ability [e.g., Biographical Inventory of Creative Behaviours (BICB)]. However, significant relations to cognitive ability are observed when the measure assesses the degree of eminence [e.g., the Inventory of Creative Activities and Achievements (ICAA) Creative Achievement]. It is well demonstrated that intellectual variables are highly predictive of "everyday" performance (Gottfredson, 1997) and also account for significant variance in real-world creative achievement (Feist & Barron, 2003).

In theory, high levels of self-reported creative achievement should also be significantly and positively related to cognitive ability. However, it is likely that no relationship is observed for everyday creative achievement measures, because there is no assessment as to the quality or eminence of the self-perceived achievements. However, the ICAA Creative Achievement scale, which does assess the magnitude of achievement, revealed a significant relationship.

Furthermore, the results of the studies of multidimensional achievement surveyed suggest some logical domain-specific relationships with cognitive ability. For instance, self-perceived creativity in science is positively related to cognitive ability, whereas culinary creativity is negatively related to cognitive ability. Scientific endeavors require greater cognitive ability than do more physical and everyday endeavors such as cooking or woodwork (Bertua, Anderson, & Salgado, 2005; Cox, 1926; Gardner, 1983). It is possible that those with higher cognitive ability pursue scientific activities while those lower in cognitive ability, but still interested in exploration and creation, choose to invest in less cognitively demanding tasks (e.g., cookery, woodwork). As a result, the relationships observed are, to some extent, self-fulfilling prophecies.

SUMMARY AND CONCLUSIONS

In the course of this chapter, studies that have examined the relationships between self-perceptions of creativity (traits, processes, or products) and the individual difference constructs of cognitive ability and personality have been reviewed.

The personality factor Openness to Experience is the most consistent predictor of self-perceptions of creativity, followed by Extraversion. The two aspects of Openness to Experience (Openness and Intellect) may influence and contribute toward self-perceived creativity and the creative process in different ways and are presented in detail earlier in the section "Spoiler Alert: The Key Trends—The Power of Openness to Experience and Extraversion." The relationship of Extraversion to creativity was strongest for achievement measures, especially domains that involved considerable social interaction. It may be contended that to create a "product" requires something outside of the head and anything within the "real world" requires some degree of sociability and interaction.

The roles of Neuroticism, Agreeableness, and Conscientiousness were more nuanced. The relationship of Neuroticism to creative self-perceptions was consistently negative and probably is a representation of the low self-esteem and social inhibition exhibited by those high in Neuroticism. However, self-perceptions of the creative process revealed that the Angry Hostility facet of Neuroticism, part of the Volatility aspect, was positively

correlated with creativity, perhaps suggesting that expression of anger in some instances might feel creative.

In general, Agreeableness was unrelated to self-perceptions of creativity. However, there could be some domain-specific and cultural effects, whereby Agreeableness is seen as beneficial to creativity in socially oriented tasks and "Eastern" cultures.

Conscientiousness demonstrated both positive and negative relationships with self-perceptions of creativity. These disparate findings can be explained with reference to the facet of creativity measurement, potential cultural differences, and the two aspects of Conscientiousness (Industriousness and Orderliness). It would appear that creativity as a self-perceived trait or in terms of productivity is related to a person's tendencies to work hard and persevere, which pertains to Industriousness. However, there is a pronounced negative relationship between the Deliberation facet of the Orderliness aspect and self-perceptions of creative processes, suggesting that the self-perceived creative process is deemed to be chaotic, disordered, and not involving careful consideration. This finding points to the importance of conducting deeper facet- and aspect-level studies specifically relating to the way that self-perceptions of creativity can be measured and the potential mechanisms at play. There are clear cultural differences too, with "East Asian" respondents perceiving there to be a far stronger role for Conscientiousness than "Western" respondents. It is likely that this is tied to the importance of a strong work ethic and dependability in "Eastern" societies (Triandis & Suh, 2002).

Self-perceived creativity traits bear little or no relation to cognitive ability. It was hypothesized that this is because lay perceptions of what it requires to be creative are more closely aligned to attitudes and interests regarding aesthetics, openness, and artistry, rather than problem solving or the ability to process information (Hughes et al., 2013). However, when people reflect on their creative process, they do report a positive relationship to fluid intelligence, the ability to rapidly process information. So too are (some) positive relationships observed for cognitive ability with creative achievement, where it might be hypothesized that real-world creative achievement will be partly dependent on general mental ability, as is the case for noncreative real-world achievement (Gottfredson, 1997).

KEY ISSUES, FUTURE DIRECTIONS, AND RESEARCH

Our review has revealed numerous rather obvious results (e.g., Openness to experience is the largest individual difference correlate) but also some that are less obvious. These specific issues and the clear gaps in knowledge that this systematic review has identified will now be discussed.

First, we indicated earlier that the traditional definitions of creativity (e.g., Plucker, Beghetto, & Dow, 2004) do not fit self-perceptions of creativity. In response we proffered a new definition that conforms to the four main elements of creativity, namely, traits, processes, environments, and products. Our review has demonstrated that combining all types of self-perception under a single label, though valuable for parsimony, is reductionist and that there is clear value in separating out these different facets of creativity even when referring to self-perceptions. Our review has also demonstrated a clear dearth of research concerning self-perceptions of creative processes and the effects of environments on creativity. Both need to be addressed within future research. Within our review, we identified 13 inventories that span 3 of the different facets of measurement (trait, process, product). We believe that using this theoretical grouping future research can conduct some construct cleanup (i.e., combine the unique elements of inventories and remove redundant measures); it is unlikely that all 13 measures are unique and rationalization would help to direct research and improve communication within and across fields. Construct cleanup will also help us to build testable models regarding the interrelations between the different elements of creative self-perceptions and to understand further how fundamental individual differences play a role in shaping self-perceptions of creativity.

Second, there is a real benefit in conducting nuanced personality research within the creativity domain. The few studies we have reviewed that have examined Aspects and/or facets have tended to be the most useful. Although these nuanced relationships have begun to receive attention (Kaufman et al., 2016), more work is needed. In the subsequent text we present hypothetical models of the potential cognitive ability and aspect-level personality relations with self-perceptions of creative traits (Fig. 11.2) and the creative process (Fig. 11.3) based on our review that we believe can help to inform future research.

Third, we found clear differences in the individual difference correlates when creative self-perceptions were linked to specific domains. It will be necessary to further explore self-perceptions across different domains of creative expression. Fig. 11.4 presents a hypothetical model, based on our review, of the individual difference predictors of self-perceptions of creativity in "Art" and "Science." Given the systematic differences in perceptions regarding "Art" versus "Science" creativity, we propose that measures of self-rated creativity should assess perceptions regarding at least these two domains, rather than assessing a domain-general opinion. If a domain-general self-perception is required, it could be generated from the self-perceived artistic, impulsivity, aesthetic factor, and the scientific, problem-solving, intellect factor. Future research should examine the subdomains of art and science; it is plausible that the sciences of engineering and physics and (dare we say it!) psychology
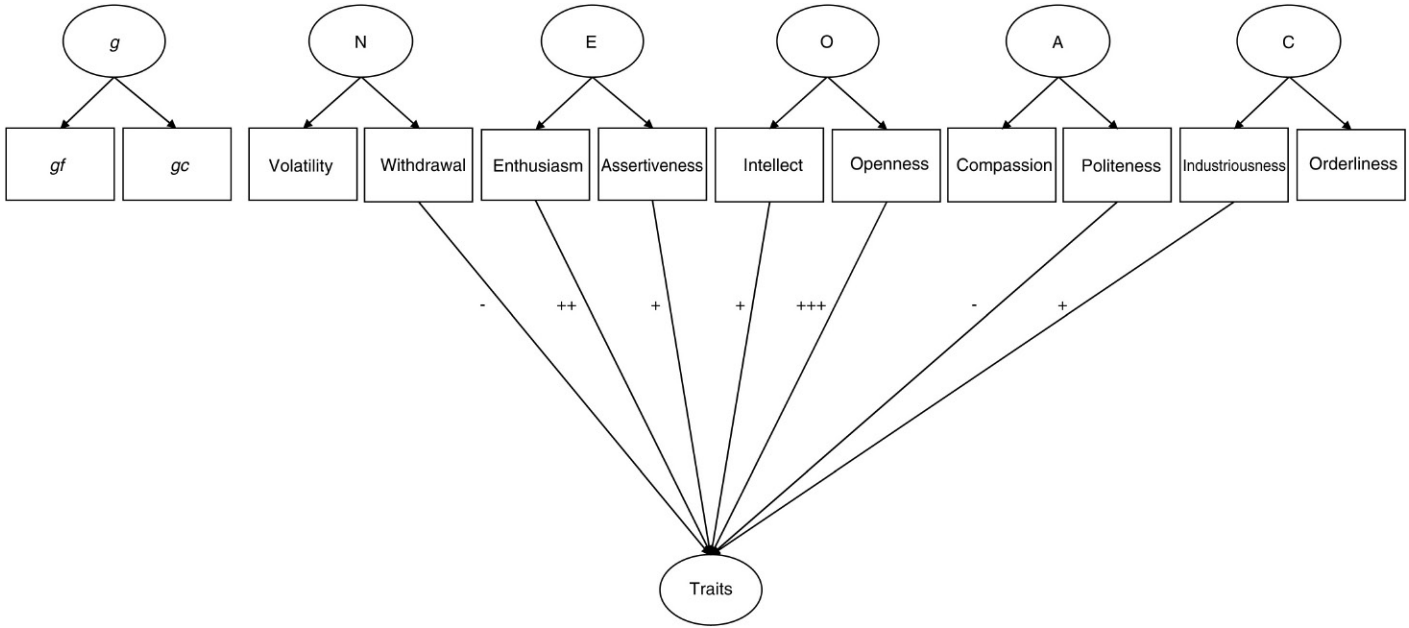
FIGURE 11.2   A hypothetical model summarizing the relationships between cognitive ability and aspects of personality with self-perceived creativity traits. *A*, Agreeableness; *C*, Conscientiousness; *E*, Extraversion; *g*, General Intelligence; *gc*, Crystallized Intelligence; *gf*, Fluid Intelligence; *N*, Neuroticism; *O*, Openness to Experience.
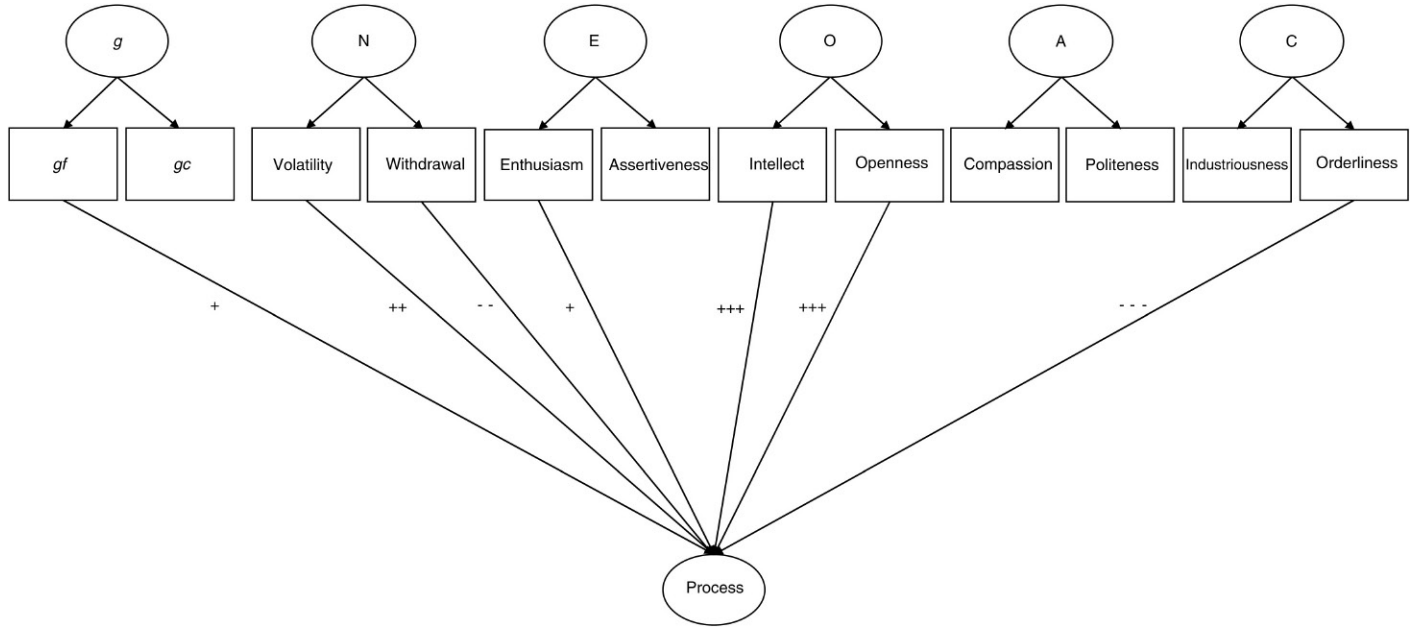
FIGURE 11.3   **A hypothetical model summarizing the relationships between cognitive ability and aspects of personality with self-perceived creative process.** *A*, Agreeableness; *C*, Conscientiousness; *E*, Extraversion; *g*, General Intelligence; *gc*, Crystallized Intelligence; *gf*, Fluid Intelligence; *N*, Neuroticism; *O*, Openness to Experience.
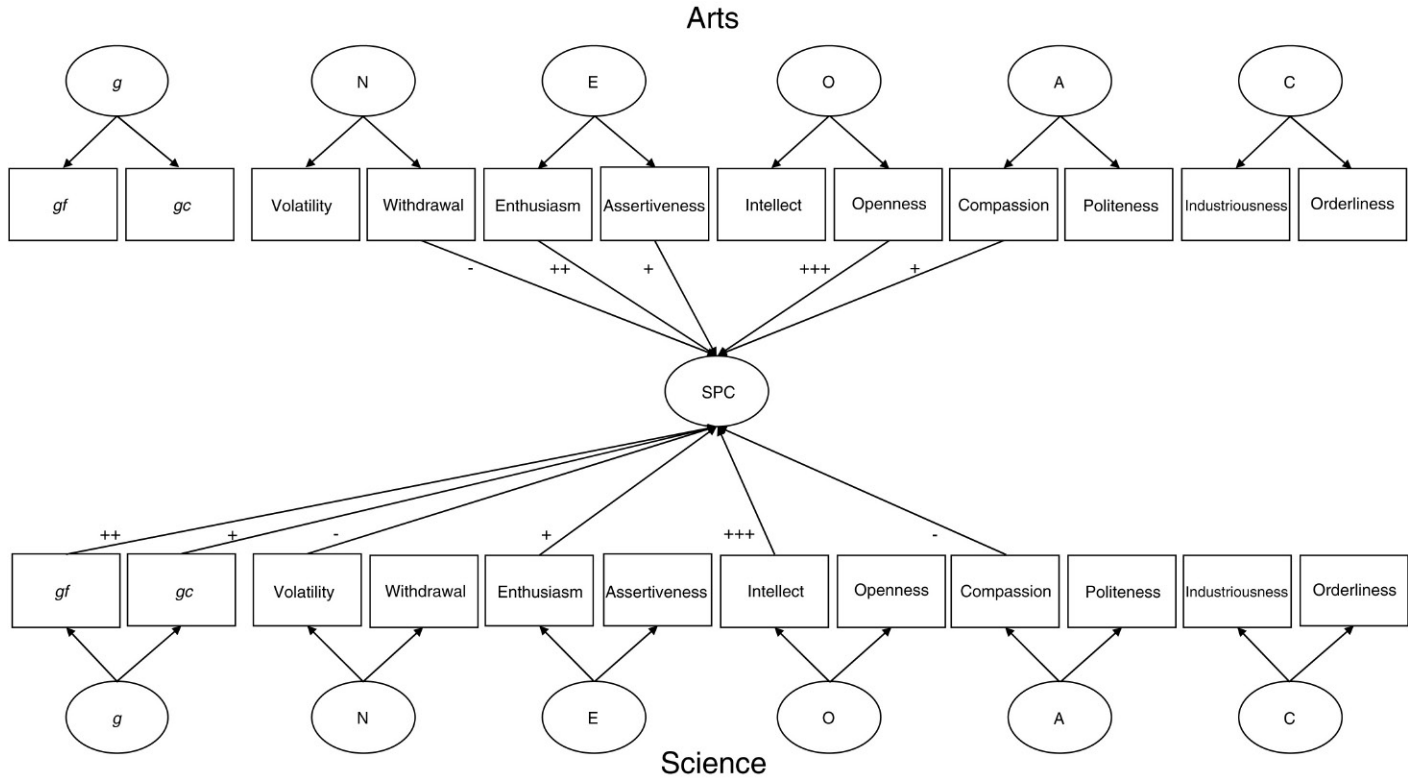
FIGURE 11.4   **A hypothetical model summarizing the relationships between cognitive ability and aspects of personality with self-perceived artistic and scientific achievement.** *A*, Agreeableness; *C*, Conscientiousness; *E*, Extraversion; *g*, General Intelligence; *gc*, Crystallized Intelligence; *gf*, Fluid Intelligence; *N*, Neuroticism; *O*, Openness to Experience; *SPC*, Self-Perceived Creativity.

have their own unique profile. So too it might be the case that actors and painters are unique.

Fourth, we also found consistent individual difference variations with regards to regional culture. Fig. 11.5 illustrates how cognitive ability and personality aspects may vary according to culture, with a specific emphasis on comparing and contrasting the "West" and "East Asia." It is clear that many more culturally sensitive investigations of creativity are required, but given the almost complete dominance of "Western" studies and the emergence of studies conducted in "East Asia," we suggest that this is a good place to start.

Finally, we now present an exploratory model that seeks to explain how individual differences and creative self-perceptions play an important role in creative behavior (Fig. 11.6). Many researchers have perhaps assessed self-perceptions of creativity because they are easier to assess than divergent thinking or other objective assessments of creative achievement. However, they are not just an easy fix; as we discussed at the outset of this chapter, self-perceptions drive motivation and effort and in turn play a pivotal role in shaping how an individual's traits and skills do (or do not) lead to real-world creative achievement.

Our hypothetical model proposes there to be two pathways for individual differences to influence creative activities and achievement. First, individual differences, as we have demonstrated in this review chapter, are consistently related to self-perceived creativity in terms of traits, processes, and products. We propose that creative self-perceptions influence the motivation to seek out and participate in creative activities and that greater engagement in creative activities will lead to a greater likelihood of amassing creative achievements. However, individual differences will also have a direct effect on motivation, creative activities, and creative achievement (Batey & Furnham, 2006). We also suggest a feedback loop, whereby engagement in creative activities and achievements will modify a person's self-perceptions of how creative their traits, processes, and products are. The model itself is general and should be applicable across domains. However, it is extremely likely that the pattern and strength of the individual difference variables will vary from domain to domain (e.g., Openness will be crucial in the arts and Intellect in science). The model also attempts to incorporate the importance of the creative press or environment. The micropress refers to the immediate environment in which the creative act takes place, such as a team or classroom climate. The meso press might refer to an organizational culture, whereas the macrolevel could pertain to regional culture. It is currently not possible to be more prescriptive regarding the press because of the lack of available research.

We believe that this chapter represents the most systematic review of the relations between core individual differences (personality and cognitive
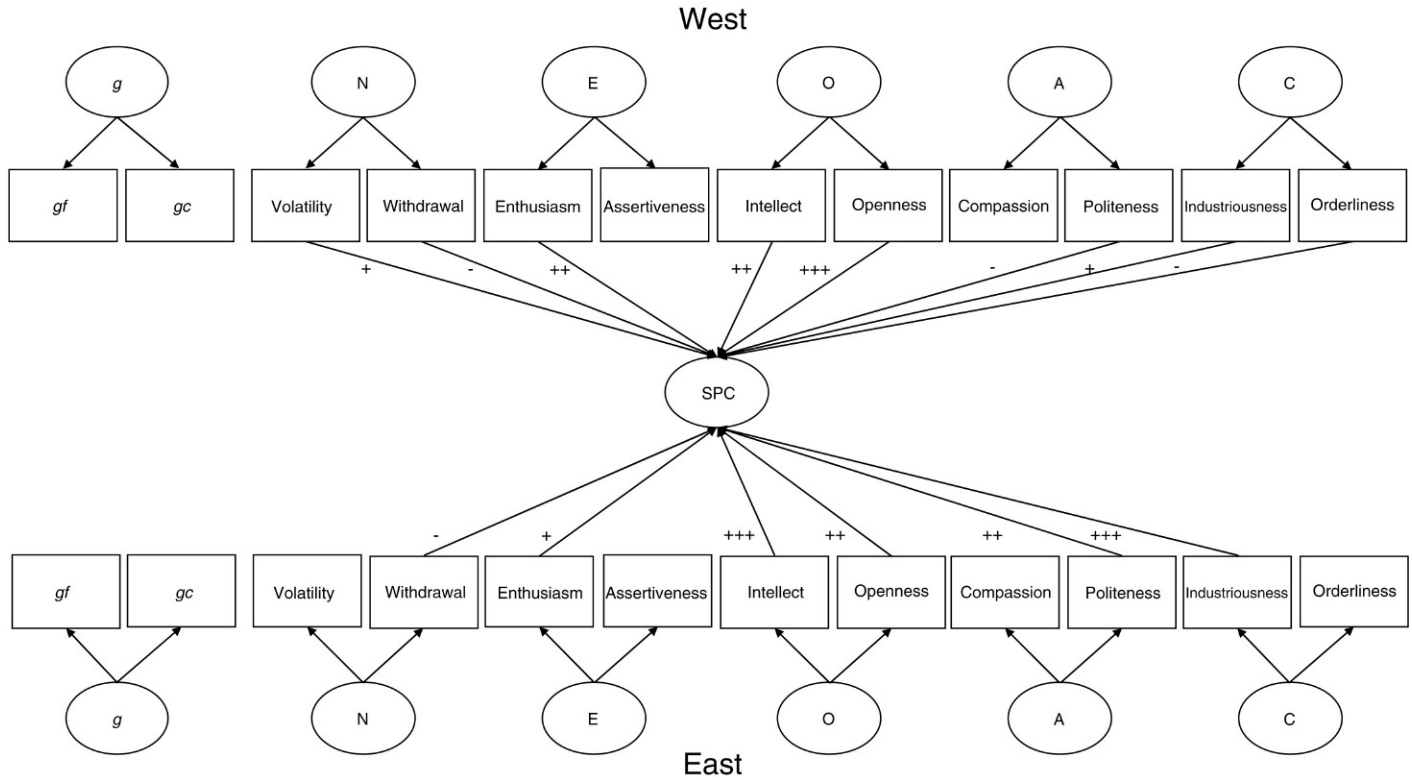
FIGURE 11.5   A hypothetical model summarizing the relationships between cognitive ability and aspects of personality with self-perceived creativity in the West and East Asia. *A*, Agreeableness; *C*, Conscientiousness; *E*, Extraversion; *g*, General Intelligence; *gc*, Crystallized Intelligence; *gf*, Fluid Intelligence; *N*, Neuroticism; *O*, Openness to Experience; *SPC*, Self-Perceived Creativity.
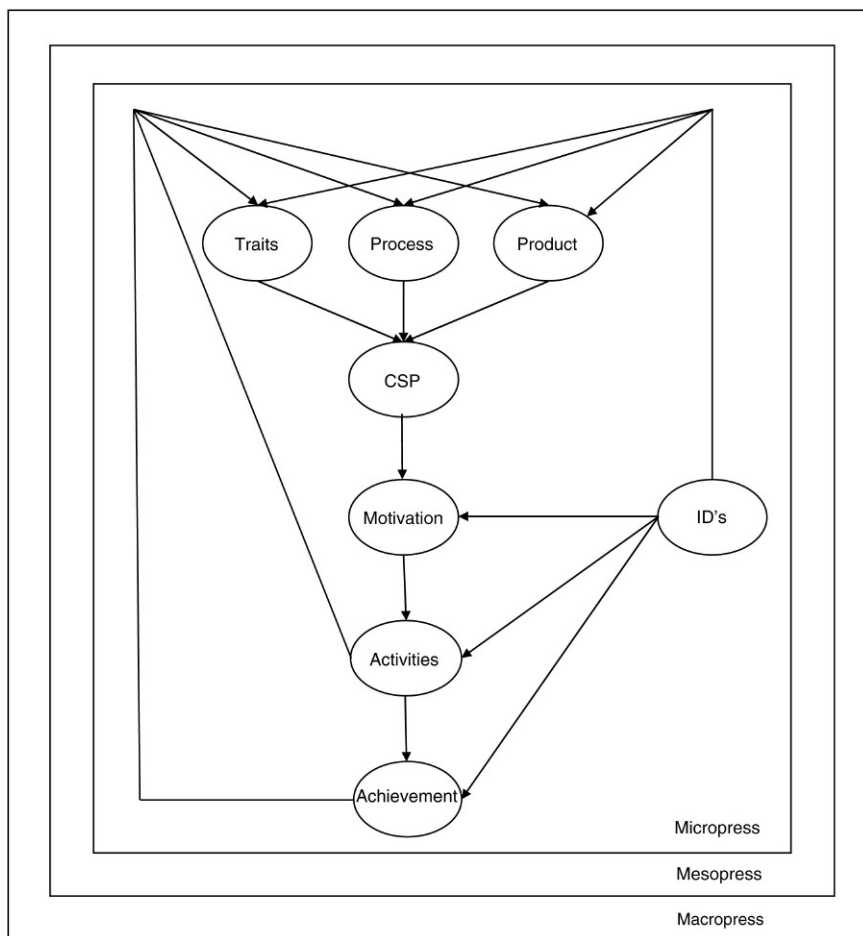
FIGURE 11.6 A hypothetical model illustrating the contribution of individual differences to creative self-perceptions and creative activities and achievements. *Achievement*, Creative Achievement; *Activities*, Creative Activities; *CSP*, Creative Self-Perception; *ID*, Individual Difference; *Process*, Self-Perceive Creative Process; *Product*, Self-Perceived Creative Products; *Traits*, Self-Perceived Creativity Traits.

ability) and self-perceptions of creativity. Not only is this review broad in scope, but it is also narrower in focus than many previous reviews. We were able to achieve this using Batey's (2012) framework to provide a theoretically robust organizing structure for the review. In doing so, we have been able to show that self-perceptions of creativity differ depending on whether they refer to one's traits, mental processes, or products, the latter of which further divides according to subject domain. We hope that this review will lead to a greater understanding of the complex individual

difference antecedents of self-perceptions of creativity. In turn, we hope that this knowledge proves useful in addressing self-perceptions during the coaching and development of creativity in educational, vocational, and organizational settings.

Acknowledgments

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Are Implicit Theories of Creativity Domain Specific? Evidence and Implications

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DOMAIN SPECIFICITY, IMPLICIT THEORIES, AND CREATIVE MINDSETS

Think about the five most creative people that you are aware of. Most likely that list will include people from a wide variety of domains including the arts, science, and technology, along with music, architecture, literature, and a variety of others. Now consider what it takes to succeed in those professions. Do the people on your list share traits, or is it more likely that they do not? This is a question that has been asked in recent studies of implicit theories of creativity (e.g., Hass, 2014; Hass & Burke, 2016; Paulhus, Wehr, Harms, & Strasser, 2002), and the answers provide intriguing insights into how people assemble their own belief systems about how creativity works in other people, along with themselves. For example, people draw on a range of exemplars when they imagine creative people and creative products, and those beliefs about creativity vary with respect to domain.

This chapter will discuss what we call a social-learning view of implicit beliefs about creativity and creative self-efficacy. That is, we propose that people construct knowledge of creative phenomena through making meaning out of everyday encounters with creative

people and creative activities in terms of a kind of social schema (e.g., Vygotsky, 1978, 1986). This positions implicit theories next to self-efficacy, such that implicit theories are likely to be constructed gradually while engaging in a task or while watching others perform (cf. Bandura, 1977). The distinction between implicit theories and self-efficacy is that implicit theories are large implicit knowledge structures containing information about thought processes (Baas, Koch, Nijstad, & De Dreu, 2015), traits (e.g., Runco & Bahleda, 1986; Sternberg, 1985), domain differences (Hass, 2014; Hass & Burke, 2016), and differences in creative outcomes (i.e., the 4 C's; Kaufman & Beghetto, 2013). Although they can generalize beyond specific instances of success and failures in task settings, self-efficacy beliefs generally pertain to the self, and how able one is to perform a given task.

We argue that implicit theorizing, like self-efficacy formation, is specific to task contexts and may not be consistent across different domains. For example, a person may have low math self-efficacy, but high literary self-efficacy, and that same person might believe that they can learn to perform better on literary tasks, but not mathematics tasks. These beliefs and expectations would grow out of repeated exposure to similar task situations, and represent the running total of successes and failures within the context of those tasks (Bandura, 1977). Creative self-efficacy research has begun to examine how efficacy expectations might operate within particular domains (e.g., Beghetto, 2006), and we will augment the results of those studies with a discussion of the recent advances in understanding of how implicit theories might also differ by domain.

The main goal of this discussion is to be able to design interventions to help people develop accurate implicit theories about creativity, which includes implicit theories about creativity in general and about their own creativity. As will be discussed, Hass and Burke (2016) showed evidence for an actor–observer asymmetry in implicit theorizing about creative success. Thus, laypeople hold different beliefs about how creativity works depending on their perspective. More importantly, Dweck (e.g., 1999; see also Dweck & Leggett, 1988) argues that implicit theories about intellectual abilities are antecedents of academic goal orientations. For example, Grant and Dweck (2003) showed that medical students who believed that their intellectual abilities were malleable chose better study strategies and were ultimately more successful. Given that recent research has shown that implicit theories about the malleability of creativity are related to creative self-efficacy in general (e.g., Hass, Katz-Buonincontro, & Reiter-Palmon, 2016; Karwowski, 2014; Katz-Buonincontro, Hass, & Reiter-Palmon, 2016), it is likely that implicit theories influence people's willingness to participate in creative activities. If a person's implicit understanding of creative behavior is incorrect or biased, especially if the bias is toward feeling like

creative thinking is beyond the person's reach, then it is likely that the development of creative thinking skills will be negatively affected.

In outlining the evidence for our position, we begin by defining our terms. We make a taxonomic distinction between implicit theories and mindsets by highlighting that mindsets are a subset of implicit theories that describe whether or not a person is able to learn to perform better on a particular task. We will then briefly review what is meant by domain specificity with regard to creative behavior, as this is a key component to our argument that implicit theories should be viewed from a domain-specific perspective. After that, we will review evidence for domain specificity of implicit beliefs about creative success, and domain specificity of creative mindsets. We end with a discussion of what this means for future studies of the influence of implicit theories of creativity.

A TAXONOMY OF BELIEF STRUCTURES

The bulk of the research on the issues raised in this article derives methods and theories from social psychology. Several interrelated concepts abound, and we define them here (see also Hass et al., 2016). An *implicit theory* is an explanation developed by a layperson for how a particular psychological phenomenon works (Sternberg, 1985). The explanation is implicit because, like implicit memories, the individual is not aware that he or she is forming such a knowledge representation, although the knowledge will influence the individual's actions. An excellent parallel is that of implicit learning of cultural musical forms and structures (e.g., Krumhansl, 1990). Throughout life we are bombarded by music from our native cultural contexts and we develop an implicit understanding of how songs "should" sound. This implicit musical knowledge is present in almost everyone, regardless of the level of musical ability, and aids perceptual organization during music listening (for a review see Collins, Tillman, Barrett, Delbe, & Janata, 2014). Implicit theories, thus, may be thought of as social-cognitive structures that help people organize knowledge of complex psychological phenomena.

Under the umbrella of implicit theories are *self-theories* described by Dweck (1999) as theories about one's own abilities and personality traits. In examining self-theories about intelligence, Dweck found that people tended to endorse one of two kinds of explanations about the nature of intellectual ability. *Entity theorists* believe that intellectual abilities are fixed and not amenable to learning, while *incremental theorists* believe that intellectual abilities are malleable (e.g., Dweck, 1986; Dweck & Leggett, 1988; Hong, Chiu, Dweck, & Lin, 1999). Recently Dweck (2006) changed terminology and began referring to entity theorists as endorsing a "fixed mindset," while incremental theorists were said to have a "growth mindset."

Much of the recent literature on creativity and implicit theories has focused on identifying *creativity mindsets* (e.g., Karwowski, 2014), but we will discuss broader classes of implicit theories here. When we are not referring to either the growth or fixed mindset, we will use the term implicit theory. When we are talking specifically about mindsets, we will use that terminology. In our view, the development of a growth or fixed mindset is dependent on the compilation of a larger implicit theory about creative success, which is then contrasted with one's own perceived competence in order to derive the more specific mindset explanation. This taxonomy allows for a more comprehensive theory of how implicit theories relate to other social psychological phenomena such as self-efficacy, attribution, and identity formation.

DOMAIN SPECIFICITY IN CREATIVE PRODUCTION

Before describing how and why implicit theories and mindsets about creativity are domain-specific, it is important to briefly address the notion of domain specificity in creative behavior. Modern research on creativity grew out of efforts of psychometricians to develop tests of general creative potential (e.g., Guilford, 1967; Torrance, 1966; Wallach & Kogan, 1965), as well as the cognitive analysis of scientific discovery and problem solving (e.g., Newell & Simon, 1972; Simon, 1996; Ward, Smith, & Vaid, 1998). Psychometric tests of creativity aimed at predicting real-world creativity across domains, while studies of problem solving tended to focus on domain-specific examples of creative individuals (e.g., Weisberg, 2006, Chapter 5). Although there is still debate as to whether a general creative potential—akin to general intelligence—can be said to account for creative productivity across domains (cf. Simonton, 1999), much of the evidence points to creative productivity being domain specific (for a review see Baer, 2010). That is, it is rare for eminent creators to produce consistent high-quality work across disparate domains. Indeed, Howe (1999) argued that it is almost impossible to name a so-called "genius" creator who has not constrained himself or herself to a single domain of productivity (e.g., Mozart in music, Edison in technology; see also Kaufman, Beghetto, Baer, & Ivcevic, 2010; Weisberg, 2006).

One potential reason for the seemingly domain-specific nature of high-level creativity can be found in the systems theory forwarded by Csikszentmihalyi (1999). According to this theory, creativity is described as a reciprocal sociocultural system with three poles: the individual creator, the domain in which he or she works, and the field of evaluators. There are bidirectional relationships among the poles, meaning that the individual receives feedback from the domain and the field about how to potentially balance the need for both novelty and utility in creative

work. There is evidence to suggest that a crucial component of learning to create quality products is in learning to incorporate feedback, but not to become discouraged (e.g., Hass & Weisberg, 2015). That is, domain specificity is likely a function of the individual's desire to economically balance his or her creative efforts with the demands of the domain and field. In the case of musical composition, the domain provides the rules and musical systems for assembling music, and the field provides feedback about what new compositions have the right amount of novelty and utility. Success is arguably more likely if the individual remains working in one or a few related domains, rather than trying to learn this balancing act across many disparate domains, all with differing skill sets.

However, arguing that creativity is domain-specific is not the same thing as arguing that one must be an expert in a particular domain in order to create top-quality products (for contrasting views see Simonton, 1999; Weisberg, 2006). Indeed, too much domain knowledge can limit novelty (Ward, 2008). The important point for the current chapter is that learning to create may involve learning to navigate a sociocultural system (cf. Csikszentmihalyi, 1999). Although the primary basis for domain-specific creativity is at the level of pro-c and Big-C creators, the social processes operating at those levels are likely operating at lower levels as well. That is, if a primary school student is assigned a creative project (e.g., constructing a diorama, which would be classified as mini-c or little-c) and that diorama is to be presented to the entire class, then the guidelines for the project become a domain and the teacher and the class become the field of evaluators. So even at the little-c level there is an evaluative aspect inherent in creative activities. One would think that little-c creators would be sensitive to evaluation, and might begin to explain their own creative performance, and the performances of others through this lens. We believe that the latter point provides important context for the evidence we now present.

EVIDENCE OF DOMAIN-SPECIFIC IMPLICIT THEORIES

A scenario similar to the one presented at the beginning of this chapter was presented to college students in two separate studies (Hass, 2014; Hass & Burke, 2016). In both studies, participants were asked to think of a specific creative product in one of an experimentally manipulated set of domains. For example, participants were asked in both studies to imagine a creative piece of music. To check the manipulation, they were instructed to describe the work, or name the song that came to mind. After describing the product, they were asked to provide ratings of a set of traits

compiled by Sternberg (1985), in terms of how well each trait described or "fit" the person who created the product they imagined. Sternberg surveyed academics and professionals in an effort to differentiate people's implicit theories of creativity from those about intelligence and wisdom. The traits ranged from statements about personality (has a free spirit) to statements about intelligence (has a high IQ), and statements about motivation (likes to be complimented on his or her work). Hass (2014) showed that people's theories reflected the stereotypical split between arts-based domains and non–arts-based domains on both the nonentrenchment dimension and the aesthetic taste dimension. More importantly, participants generated a slew of interesting exemplars, many of which were modern, rather than classical examples of products (e.g., a Kanye West song, rather than a Beethoven Sonata). This provided the first glimpse of evidence that people are compiling these assessments through direct experience with creative products.

In a follow-up study, Hass and Burke (2016) showed that these domain differences vanish when participants are asked to perform the entire task from the first-person perspective. That is, an additional manipulation was instituted such that half of the participants completed the task as before—this time with only three domains: art, technology, and music—while the other half of participants thought about having to create their own artwork, technological gadget, or piece of music. As before, all participants rated a set of traits for fitness to their exemplar, again with half of the participants essentially assessing their own traits. The results of Hass (2014) were replicated such that third-person ratings reflected the art versus science stereotype. However, the first-person assessments were flat with respect to domain. The first-person ratings were also generally lower than the third-person ratings, suggesting that these implicit theories are always evaluated with respect to high-impact exemplars.

In another recent study, Lee, Kim, Ryu, and Song (2015) contrasted two explanations for how people's self-theories should relate to theories about how others should act. In the correspondence view (e.g., Bem, 1972), people's self-theories should not differ from their explanations of the behavior of others. Conversely, many studies of the actor–observer asymmetry (e.g., Malle, Knobe, & Nelson, 2007) suggest that people make very different causal attributions depending on whether they are observing or performing an action. Although Lee and coworkers did not experimentally manipulate the domains of creative activity, they showed support for the actor–observer asymmetry hypothesis. The results of Hass and Burke (2016), showing an interaction between perspective and domain, support the actor–observer asymmetry hypothesis as well. Thus, implicit theories about creative success are likely constructed with input from attributional processes. It is therefore not surprising that different contexts of creativity

would give rise to different implicit theories, since causal attributions are heavily dependent on context (e.g., Malle et al., 2007).

Similar work by Reiter-Palmon, Robinson-Morral, Kaufman, and Santo (2012) evaluated self-perceptions of both general creativity and in multiple domains. Specifically, participants were asked to provide ratings on multiple statements evaluating their own creativity (e.g., I am a good source of creative ideas). The statements were provided in four different formats to each participant: first, evaluation of creativity in general, and then in random order each statement ended with "at work," "at school," and "in my hobbies." Results indicated that a four-factor model, with statements about each domain loading independently on their own factor, and a separate general factor provided the best fit to the data. The four-factor model showed a better fit than a one-factor model, or a nested model in which the three specific domains were nested under the general factor (a higher-order factor). These results suggest that indeed self-perceptions and implicit theories are domain specific. Similar research by Kaufman, Cole, and Baer (2009), using traditional creative domains, found a general higher-order factor but also eight specific factors. So while evidence for domain specificity exists in self-perceptions, there is also evidence that laypeople view creativity as an overarching influence on specific instances of creativity.

EVIDENCE OF DOMAIN SPECIFICITY OF MINDSETS

Although the results just reviewed show support for domain specificity of implicit theories, creative outcomes were not measured in any of the studies. As the relationship between implicit theories and creative outcomes is a key factor in designing potential developmental interventions, we now turn to a discussion of recent studies of mindsets that have begun to ask whether the relationship between creative mindsets and creative outcomes varies by domain. We will review two streams of research on this topic: studies of mindsets by academic domain and studies of mindsets in work environments.

Mindsets Across Academic Domains

The theme of student creativity has resurfaced in American public educational discourse (Darling-Hammond, 2001; Obama, 2011; Trilling & Fadel, 2009) coupled with an increase in published research in education and psychology (Beghetto, Kaufman, & Baer, 2014; see also Kaufman, Plucker, & Baer, 2008). For example, public concern about the "creativity crisis" (Bronson & Merryman, 2010), which is grounded in

criticisms of schools for insufficiently preparing students to think and act creatively (Kim, 2011; Robinson, 2006), has helped to fuel debates about how to better promote student creativity. Since Dweck (e.g., 1999) has shown a tremendous amount of support for the influence of mindsets in academic environments (see Bodill & Roberts, 2013), many recent studies have focused on the nature of creative mindsets (for a review see Karwowski, 2014). However, past research shows differences in peoples' perceptions of their own creative abilities relative to different domains as measured with the Kaufman Domains of Creativity Scale (K-DOCS; Kaufman, 2012; Kaufman et al., 2008). Thus, it is likely that different academic content domains would think differently about creativity and have their own definitions.

For example, Katz-Buonincontro (2015) found that incremental (malleable) and entity (fixed) views about creative competence emerged unexpectedly through discussion, workshops, and focus groups in a qualitative study of creativity in engineering technology courses (see also Klawans et al., 2014). Faculty expressed beliefs that students' creativity and intelligence were either fixed or malleable. For example, two of the faculty specifically discussed creativity and intelligence as "something you are born with, or not."[a] They perceived students as coming into the classroom either possessing intelligence and creativity or not. In contrast, several of the students articulated creativity as intrinsic to their academic and professional identity. One student, in particular, commented about creativity as domain-specific, stating that, "Everything is driven by ideas, and you need to be creative to have ideas. Everything starts with an idea and progresses from there." In engineering design, ideas have to be constructed with respect to domain knowledge, which can often lead to fixation on elements of existing designs (e.g., Chrysikou, 2006; Chrysikou & Weisberg, 2005; Kohn & Smith, 2010).

Motivated in part by these qualitative findings, we asked whether the relationship between mindsets and everyday creative behaviors was dependent on academic domain (Katz-Buonincontro et al., 2016). We utilized Karwowski's (2014) creative mindsets scale along with K-DOCS (Kaufman, 2012). The K-DOCS measures creativity through five dimensions of self-report items designed to examine levels of everyday, scholarly, performance, mathematical/scientific, and artistic creativity. We focus here on the results of the everyday creativity subscale. Fig. 12.1 shows the linear relationship between fixed mindset scores and everyday creativity. Academic domains were assigned to participants via their self-reported majors, with five main groupings: Arts and Humanities, Business, Education, Life Sciences, and Social and Behavioral Sciences

[a]Narratives were qualitatively analyzed by Katz-Buoninocontro and presented orally, but do not appear in a published manuscript.
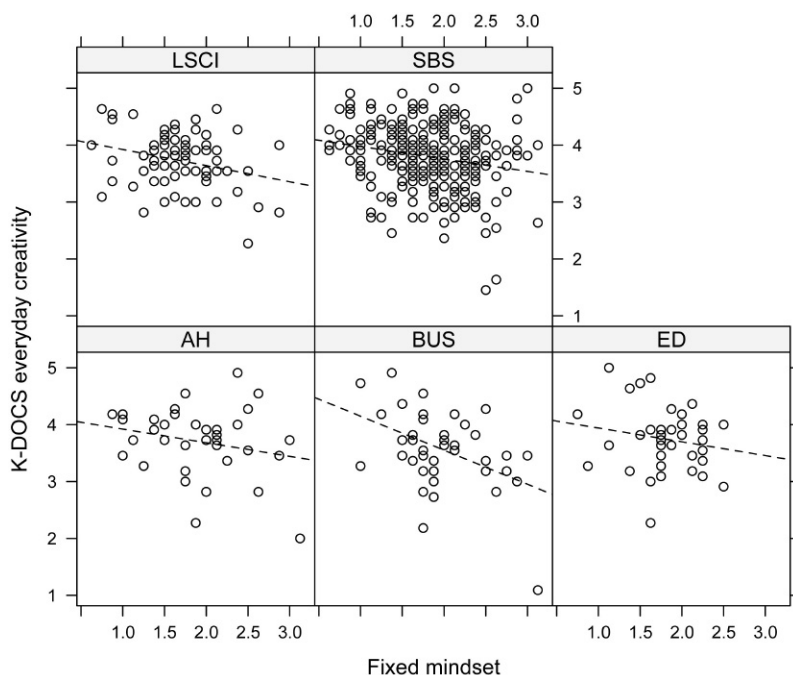
FIGURE 12.1 **Relationship between fixed mindsets and everyday creativity for five academic domains.** *AH*, Arts and Humanities; *BUS*, Business; *ED*, Education; *K-DOCS*, Kaufman Domains of Creativity Scale; *LSCI*, Life Sciences; *SBS*, Social and Behavioral Sciences.

(N = 484). As can be seen, there is a general negative correlation between fixed mindsets and everyday creativity, but the strength of that relationship varied across the five domains.

Fig. 12.2 shows a similar effect of domain on the strength of the relationship between growth mindsets and everyday creativity across the five academic domains. Notably, arts and humanities majors' growth mindsets seemed to be independent of their everyday creativity reports, while the other domains showed positive, but variable correlations.

To summarize, there is evidence that within each domain people are split as to whether creativity can be cultivated with respect to the domain. However, in relating mindsets to creative outcomes, a general trend emerged such that fixed mindsets tended to be negatively correlated with everyday creativity while growth mindsets were positively correlated with everyday creativity. At the same time, we see that there is interdomain variance regarding the strength of those correlations, as one would expect given the intradomain variance of mindsets manifested in Katz-Buonincontro's (2015) qualitative data.
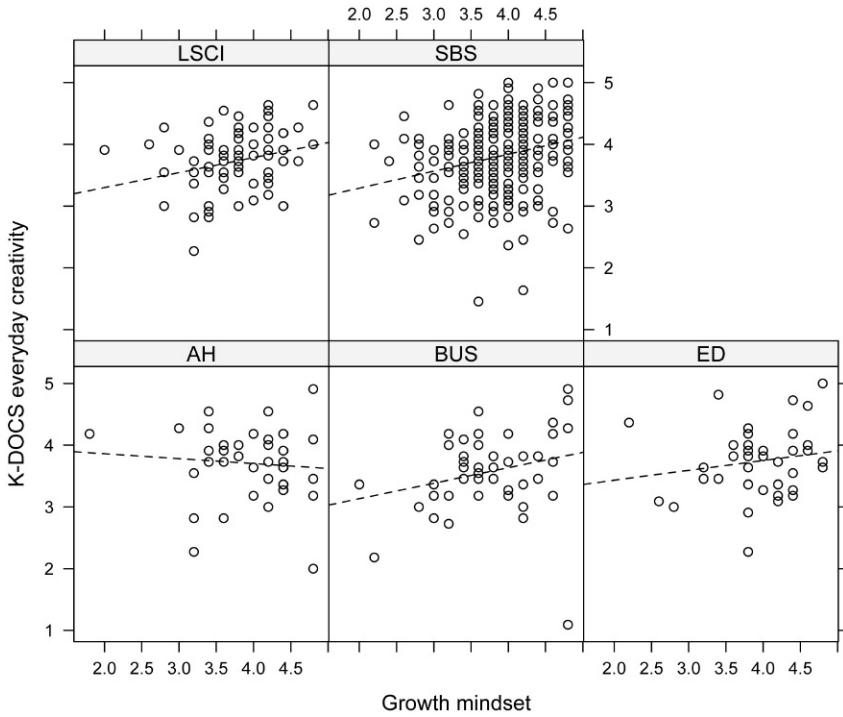
FIGURE 12.2 **Relationship between growth mindsets and everyday creativity by aca-demic domain.** *AH*, Arts and Humanities; *BUS*, Business; *ED*, Education; *K-DOCS*, Kaufman Domains of Creativity Scale; *LSCI*, Life Sciences; *SBS*, Social and Behavioral Sciences.

Mindsets at Work

Much of the current research on creativity in workplace in relation to implicit theories has focused on the relationship between goal orientation and creative performance. Goal orientation constructs have developed from the perspective of ability mindsets (Elliot & Harackiewicz, 1996). Goal orientation focuses on achieving, understanding, or learning tasks, and is frequently considered to have three distinct dimensions: (1) performance-prove reflecting the desire to prove competence, (2) performance-avoid reflecting the desire to avoid showing incompetence, and (3) learning, or mastery (Elliot & Church, 1997). Individuals possessing a performance-prove or performance-avoid orientation believe that their abilities relat-ed to a task are at a fixed level. These individuals either act to exhibit their aptitude (known as performance-prove) or act to avoid exhibiting ineptitude, or lack of ability (known as performance avoidance) (Elliot & Harackiewicz, 1996; Payne, Youngcourt, & Beaubien, 2007). In contrast, in-dividuals with a learning, or mastery, motive believe that they are able to

grow and develop their task-relevant abilities. Learning goal orientation has been shown to be related to learning, persistence, and effort (Grant & Dweck, 2003; Payne et al., 2007). Studies investigating the relationship between goal orientation and creativity in the workplace found positive relationships between learning orientation and creativity, and negative relationships between performance-avoid orientation and creativity (Gong, Huang, & Farh, 2009; Hirst, van Knippenberg, & Zhou, 2009; To, Fisher, Ashkanasy, & Rowe, 2012).

One important issue that has not been studied until now is how creativity mindsets relate to these concepts of goal orientation. Previous research on the relationships between goal orientation and creativity as well as mindsets and creativity suggests that mastery motives or learning goal orientation should be positively related to growth mindset and negatively related to fixed mindset of creativity. The opposite relationship is expected with performance-avoid, which we would expect to be positively related to fixed mindsets and negatively related to growth mindsets. A recent study [Royston, R. (2015). *The relationship between big-c, little-c, and pro-c creativity and fixed and malleable creative mindsets*. Unpublished thesis] has found support for these relationships. The correlations between growth mindset and mastery motive and between fixed mindset and performance-avoid were moderate and positive ($r = 0.37$ and 0.22, respectively). The correlation between growth mindset and performance-avoid was small and negative ($r = -0.14$), while the correlation between fixed mindset and mastery motive was nonsignificant (but negative in direction). The same study also evaluated the relationship between creative mindsets and creative problem solving of a work-related problem. Growth mindset was positively correlated with solution quality and originality of the solution generated ($r = 0.16$ and 0.19, respectively). Fixed mindset was negatively correlated with quality originality ($r = -0.19$ and -0.15, respectively). Research so far suggests that creative mindsets may be important for workplace creativity; however, research on this topic is limited.

BRINGING IT TOGETHER

In the beginning of this chapter we argued that since self-efficacy expectations are tied to specific task contexts, and since implicit theories are related to self-efficacy, implicit theories should show some evidence of domain specificity. Indeed, we found interdomain differences in implicit theorizing and in the effect of mindsets on creative outcomes. However, the direction of the mindset–creativity correlations was consistent across domains. At the same time, mindsets can be directly tied to goal orientation in the workplace literature, which suggests that mindsets should be somewhat goal-directed, and thus specific. This makes mindsets similar to

self-efficacy, and, indeed, quantitative analyses have shown that growth mindsets are related to self-efficacy (Hass et al., 2016; Karwowski, 2014; Royston, 2015, unpublished).

The research discussed here provides a rich avenue for further pursuit of the concept of creative mindsets. As noted in the qualitative study (Katz-Buonincontro, 2015), both teachers and students have their own distinct conceptions about whether creativity is fixed or malleable. Not only are individual conceptions important, but also the various combinations of teacher–student perceptions are important. What are the implications of having a mismatch between teacher and student perceptions? How would teacher perceptions influence student perceptions? How would these influence student outcomes in the classroom and beyond? All of these are important questions that must be addressed.

Similarly, the evidence presented here from qualitative studies suggests that implicit theories may indeed be domain specific. However, the current measures of fixed and malleable mindsets are general in nature. It is therefore not surprising that we are not able to find strong evidence of domain specificity based on academic domain (Katz-Buonincontro et al., 2016). Consequently, an important question that has not been addressed is whether we will find domain differences if creativity mindsets are measured more specifically. That is, if we ask individuals about whether they believe creativity in the arts (or writing, music, etc.), math, or science is fixed or malleable, would that relate to creative performance in that domain differentially than the general measure? We would suspect that this is the case. In fact, given that most creative endeavors are voluntary in nature, where individuals choose an occupation or hobby that requires creativity, we would expect individuals who have a fixed mindset to avoid those situations, whereas individuals who have a growth mindset may be attracted to such occupations or hobbies.

Another issue to consider is how creativity is measured. Most of the studies cited earlier used self-report measures of creativity. It is possible that one of the reasons for the effects found is that both types of measures, creativity and mindsets, tap into the same construct of implicit theories discussed in this chapter, resulting in potentially inflated relationships. Indeed, all of the measures tend to include domain-general statements (e.g., "No one is born creative…"). Beghetto (2006, see also Beghetto, Kaufman, & Baxter, 2011) adapted the general self-efficacy items produced by Tierney and Farmer (2002) to mathematics and science, and we strongly urge future researchers to do the same with regard to mindsets and also implicit theories. Of course, relationships with more objective measures of creativity as opposed to self-perceptions would add to our understanding of creative mindsets and their effects on creative performance.

CONCLUSIONS

In the course of this chapter, we have provided evidence that people theorize about their own creativity and the creativity of others based on their social experience with the world. This is a kind of social learning that is similar in spirit to that described by Bandura (1977) and Vygotsky (1978). That is, people compile folk psychological knowledge of creativity from first- and third-person experience with specific creative task environments. However, the connection between that knowledge and creative behavior is yet to be determined.

We also presented preliminary evidence that creative mindsets are related to goal orientation in work environments. If it is the case that mindsets are themselves a product of social learning, and that they are indeed antecedents of goal orientation, then there is potential for educators, supervisors, and parents to provide a social context conducive to the development of accurate implicit theories of creativity, and growth mindsets. The future of this type of research is wide open and provides exciting opportunities for future scientific inquiry.

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SPECIFIC CONSIDERATIONS

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Creative Self-Efficacy From the Chinese Perspective: Review of Studies in Mainland China, Hong Kong, Taiwan, and Singapore

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INTRODUCTION

As early as in 1953, Stein cautioned that creativity must be defined and measured in terms of the culture in which it appears, as a creative product must be recognized and accepted within the sociocultural context in which it was created. This assertion is echoed by modern systematic theories of creativity (e.g., Csikszentmihalyi, 1988), which propose that creativity is a process resulting from an interaction between the culture, the social system, and the individual. Creative self-efficacy (CSE), defined as the belief about one's ability to produce creative outcomes (Tierney & Farmer, 2002), is a highly dynamic construct that is susceptible to various internal (e.g., personal experience, physiological or emotional states, personality) and external factors [e.g., social persuasion, socioeconomic status (SES)] (Bandura, 1997; also see Beghetto & Karwowski, this volume). Culture plays an important role in shaping one's thoughts and behavior. Studies incorporating different cultural perspectives can help enhance understanding of the relationship between culture and self and increase the generalizability of theories that explain self-functioning (Marsh, Hau, & Kong, 2002).

In spite of the potential value cross-cultural investigations have on our understanding of CSE, research taking a cross-cultural perspective on CSE is rare. Literature search in PsycINFO, PsycBOOKS, PSYNDEX, ERIC, and SocINDEX with "creative self-efficacy" and "cross-cultural" in ABSTRACT for the time period 2002[a] to the writing of this chapter (October 2016) issued only one summary of conference topics. Extending the search in the same databases using "creative self-efficacy" in ABSTRACT and "cross-cultural" in ALL TEXT issued two more entries, including one cross-validity study of a Measure of Creative Identity (treating CSE as a subcomponent of creative identity) using samples from the USA and Finland (Randles & Muhonen, 2015) and another study comparing the philosophical and pedagogical patterns of beliefs (but not specific CSE) of Vietnamese and Australian preservice teachers (Ly & Brew, 2010). The scant literature is of no help for our understanding of CSE from a cross-cultural perspective. As a remedial solution, we focused our search on the existing bulk of literature using samples from Chinese societies (mainland China, Hong Kong, Taiwan, and Singapore). Literature is identified in the aforementioned databases using "creative self-efficacy" in ABSTRACT and "Chinese" in ALL TEXT for the time period 2002–2016. To enrich our views, we also included studies published in Chinese language by using China National Knowledge Infrastructure (CNKI) with "创造力自我效能," "创造性自我效能" or "创新自我效能"—all three are the Chinese translations of "creative self-efficacy"—in ABSTRACT. Combining the literature published in both English and Chinese, we hope to enrich our understanding of CSE from a different perspective other than the dominant Western perspective.

CHINESE CONCEPTS AND MEASUREMENTS OF CREATIVE SELF-EFFICACY

CSE, a specific form of self-efficacy, is an individual's subjective judgment of his/her own ability to be engaged in creative activities. Tierney and Farmer (2002) defined CSE as an individual's self-belief of his/her ability to be creative. Likewise, Beghetto (2009) and Abbott (2010) defined CSE as a person's self-judgment of one's competence of coming up with novel and appropriate ideas, finding creative solutions, and conducting creative behaviors. Choi (2004) stressed the role of an individual's previous creative behavior and maintained that CSE is an individual's perception of the level of difficulty of the creative endeavors that he/she is taking

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[a]2002 was chosen as the beginning of the time period for literature search to reflect the publication of Tierney and Farmer's (2002) study of the construct of CSE, which has boosted creativity studies taking CSE into consideration.

based on his/her previous creative achievements. Most CSE studies using Chinese samples directly applied or adapted these conceptualizations and definitions of CSE. Accordingly, the CSE instrument developed by Tierney and Farmer (2002) is among the most frequently used CSE instruments in the Chinese studies (Tables 13.1 and 13.2).

In educational settings, several CSE instruments have been developed by Chinese researchers for their indigenous studies. For example, Chinese scholar Yang (2007a) developed a CSE scale for college students, assessing self-efficacy in sensitivity, flexibility, originality, and fluency. The internal consistency of this scale is high with Cronbach α of 0.89 and the 2-week retest r of 0.87. Applying the CSE concept of Tierney and Farmer (2002) to teaching, Lin and Qiu (2004) developed the Scale of Self-Efficacy in Creative Teaching. This scale is composed of three items assessing teachers' positive versus negative self-efficacy in creative teaching and their self-efficacy of their ability of contending with the environment. In his study about Chinese graduate students' CSE, He (2014) used his own instrument of CSE, which was composed of four subscales including self-efficacy in construction of knowledge (Cronbach $\alpha = 0.73$), selection of creative methods (0.76), application of creative methods (0.83), and completion of creative tasks (0.78). Taiwanese scholars Hung and Lin (2004) have developed the Student Creative Self-Efficacy Scale, assessing students' self-belief in creative thinking strategies, production of creative products, and one's ability to resist negative evaluations. This scale has also achieved satisfactory level of reliability and validity (as cited in Yang, 2007b) and has been widely used in educational studies on CSE in both mainland China and Taiwan (Table 13.1). In Singapore, Tan [Tan, A. G. (2007). Development of creativity efficacy scales. Singapore: National Institute of Education. Unpublished manuscript] classified Beghetto's (2006) 3 CSE items as measures of the "cognitive style" dimension of CSE (e.g., "I am good at coming up with new ideas") and extended this instrument into 10 items that also included the measures of "working style" dimension (e.g., "I can focus on solving problems and complete activities"). The construct and internal consistency of the measures were tested in a later study with a high school student sample (Tan, Ho, Ho, & Ow, 2008). It was found that the two-factor construct of the instrument was confirmed and the internal consistency of the instrument was acceptable, with Cronbach α of 0.80 and 0.82 for the cognitive style subscale and 0.74 and 0.76 for the working style subscale.

The aforementioned CSE scales are mostly developed in and applied to the field of educational psychology. In the field of organizational psychology, although more studies have paid attention to CSE, instruments are usually translated and adapted from the established instruments developed in the Western countries, such as the CSE scales of Tierney and Farmer (2002) and Carmeli and Schaubroeck (2007). In spite of the wide

TABLE 13.1 CSE Studies Using Chinese Samples in Educational Settings (2002–2016)

References	Sample	Region	Publication Language	CSE as …	Relevant Findings	CSE Instrument
He (2014)	243 graduate students	China	Chinese	DV	Males reported higher CSE than females; students from a higher grade reported higher CSE than those from a lower grade; students of key universities at the provincial level reported lower CSE than those belonging to the 211 Project; no significant differences in CSE between science/engineering graduates and liberal arts graduates	Self-developed
Hui (2015)	1729 adults aged 18 to 60 plus	Hong Kong	English	DV	Both psychological factors and cultural factors explained a significant variance of 44% in predicting CSE; the cultural factors mediated the effects of psychological factors on CSE	N.A.
Hung et al. (2008)	636 undergraduates	Taiwan	Chinese	DV and mediator	Positive feedback was directly predictive of CSE and extrinsic motivation; CSE and motivation mediated the effect of significant others' feedback on creativity	Hung and Lin (2004)
Li and Liu (2014)	130 art students	China (Changchun City)	Chinese	Mediator	CSE played as a partial mediator on the relationship between thinking style and artistic creativity	Tan (2007)
Li and Wang (2011)	656 seventh- to ninth-graders	China	Chinese	DV	Higher CSE among girls than among boys, particularly in their self-beliefs in coming up with creative strategies; the seventh-graders rated their CSE significantly higher than the eighth- and ninth-graders; pupils from less developed regions rated their CSE lower than those from the more developed regions	Hung and Lin (2004)

Li and Wu (2011)	970 undergraduate students	Taiwan	English	Mediator	CSE partially mediated the relationship between optimism and innovative behavior	Tierney and Farmer (2002)
Tan et al. (2013)	545 high school students	China	English	DV	CSE is multidimensional; the classroom environment played an important role in influencing students' CSE	Self-developed
Tang and Ding (2014)	930 graduate students	China	English	Control variable	Two dimensions of students' professional virtual community behaviors significantly predicted their creativity after controlling students' intrinsic motivation and CSE	Tierney and Farmer (2002)
Wang et al. (2009)	473 fifth- and sixth-graders	China	Chinese	Mediator	CSE completely mediated the relationship between family environment and the creative tendency; the knowledge dimension of the family environment enhanced the CSE of pupils, which in turn increased the creative tendency of the pupils	Hung and Lin (2004)
Zhang et al. (2011)	216 eighth-graders	China	Chinese	IV	In the absence of pressure, CSE could significantly predict creativity. In the presence of pressure, the thinking flexibility of the pupils who had the lowest and highest CSE dropped more dramatically than that of the pupils who had a middle-level CSE	Hung and Lin (2004)

CSE, Creative self-efficacy; DV, dependent variable; N.A., Not available; IV, independent variable.

TABLE 13.2 CSE Studies Using Chinese Samples in Organizational Settings (2002–2016)

References	Sample	Region	Publication Language	CSE as …	Relevant Findings	CSE Instrument
Du et al. (2015)	531 employees	China	Chinese	Mediator	CSE partially mediated the positive relationship between the organizational error management culture and creativity	Carmeli and Schaubroeck (2007)
Gong et al. (2009)	277 insurance agents and 111 supervisors	Taiwan	English	Mediator	Employee learning orientation and transformational leadership were positively related to employee creativity, and these relationships were mediated by employee CSE	Tierney and Farmer (2002)
Gu and Peng (2011)	478 employees	China	Chinese	IV	The positive effect of CSE on creative behavior was mediated by achievement motivation and work involvement	Tierney and Farmer (2002)
Hong and Wang (2011)	179 knowledge workers	China	Chinese	Mediator	Supportive supervision and job complexity were positively associated with the creativity of knowledge workers, and these relationships were mediated by CSE	Tierney and Farmer (2002)
Hsu et al. (2011)	120 spa employees	Taiwan	English	IV	The positive relationship between CSE and innovative behavior was moderated by optimism	Tierney and Farmer (2002)
Hu and Zhao (2016)	274 dyads of employees and supervisors of 5 companies	China	English	Mediator	CSE mediated the effect of knowledge sharing on employee innovation; job satisfaction enhanced the relationship between CSE and employee innovation	Carmeli and Schaubroeck (2007)

Jiang and Yang (2014)	221 employees	China	Chinese	Mediator	CSE fully mediated the relationship between critical thinking and creativity; the leader–member exchange weakens the relationship between critical thinking and CSE	Tierney and Farmer (2002)
Qu and Kang (2014)	349 employees	China	Chinese	Moderator	CSE moderated the relationship between transformational leadership and creativity and between contingent-reward leadership and creativity in that both leadership styles were more facultative to employees' creativity for those whose CSE was not very high	Carmeli and Schaubroeck (2007)
Shin et al. (2012)	316 employees of 68 teams of 3 companies	China (north)	English	Moderator	Team member's CSE moderated the relationship between cognitive team diversity and individual creativity in that this relationship was positive only when CSE was high	Carmeli and Schaubroeck (2007)
Sun et al. (2012)	334 employees of 75 teams from 13 big companies	China	Chinese	IV	The positive relationship between CSE and innovative behavior was fully moderated by knowledge sharing	Tierney and Farmer (2002)
Wang and Ye (2015)	308 employees	China	Chinese	Mediator	CSE fully mediated the positive relationship between ethical leadership and followers' creativity; the performance moderated the mediated relationship through CSE, that is, the higher the performance, the stronger the mediated relationship	Tierney and Farmer (2002)

TABLE 13.2 CSE Studies Using Chinese Samples in Organizational Settings (2002–2016) (*cont.*)

References	Sample	Region	Publication Language	CSE as …	Relevant Findings	CSE Instrument
Yang and Zhang (2012)	334 employees of 75 teams of 13 companies	China	Chinese	Moderator	CSE moderated the relationships among team communication, job insecurity climate, and innovative behavior such that the effect of job insecurity was stronger for employees with low CSE	Tierney and Farmer (2002)
Yang et al. (2012)	497 employees	China	Chinese	Mediator	CSE had a mediating effect on the relationship between organizational culture and employee innovational behavior	Tierney and Farmer (2002)
Zhang and Long (2013)	296 dyads of employees and supervisors	China	Chinese	Mediator	Pay for performance (PFP) had unique reversed U shape indirect effects on employee creativity via CSE; the impact of PFP on employees' creativity was moderated by person–job fit and mediated by CSE	Tierney and Farmer (2002)
Zhou and Long (2011)	286 dyads of employees and supervisors	China	Chinese	Moderator	Effect of job insecurity was stronger for employees with low CSE; intrinsic motivation mediated the relationships of job insecurity and CSE to creativity; the effect of job insecurity was moderated by CSE	Tierney and Farmer (2002)
Zhou et al. (2012)	270 dyads of employees and supervisors of 3 companies	China	English	Mediator	The relationship between problem-solving demand (PSD) and creativity was mediated by CSE; intrinsic motivation moderated the relationship between PSD and CSE such that the relationship was stronger for individuals with high intrinsic motivation	Tierney and Farmer (2002)

CSE, Creative self-efficacy; IV, independent variable.

use of these instruments, to our knowledge, there are no validity studies of these instruments using Chinese samples yet. This stands out to be one direction of future studies, which will be discussed in detail in a later part of the chapter.

CSE STUDIES IN CHINA

Since the construction of CSE as an important correlate of creativity (e.g., Beghetto, 2006; Tierney & Farmer, 2002), more and more researchers started to include CSE in their creativity studies using Chinese samples. Their scientific inquiries use samples of different age and professional groups in different settings. This chapter focuses on the educational and organizational settings. In both settings, CSE has been studied as a predictor, control variable, mediator, moderator, or dependent variable, the same as what Farmer and Tierney (this volume) have found in their review of CSE studies with a more heterogeneous bulk of literature. Tables 13.1 and 13.2 present the major literature about CSE studies using Chinese samples in educational and organizational settings, respectively.

CSE STUDIES IN EDUCATIONAL CONTEXT

CSE as a Dependent Variable

Self-efficacy of a certain domain is the strongest predictor of the achievement in that domain (Bandura, 1997). There is evidence that CSE has a significant effect on creative behavior and can substantially predict creative achievements (Tierney & Farmer, 2002). In China, using a sample of 216 pupils, Zhang, Wang, Chu, and Xu (2011) demonstrated the positive link between CSE and creative behavior. They examined the effect of CSE on creativity on three conditions: competition, evaluation, and time pressure. Results showed that in the absence of pressure, CSE could significantly predict creativity. In presence of pressure, the thinking flexibility of the pupils who had the lowest and highest CSE dropped more dramatically than that of the pupils who had a middle-level CSE. Interestingly, they found that overall the time and competition pressure increased the fluency of the thinking, whereas evaluation and competition pressure increased the originality of the thinking. In another study, Tan, Li, and Neber (2013) treated CSE as a dependent variable and provided evidence to the multidimensional nature of CSE and found that classroom environment played an important role in influencing high school students' CSE. Also examining CSE as a dependent variable, one study with 636 undergraduates in Taiwan found that positive feedback was directly predictive

of CSE and extrinsic motivation, but not predictive of intrinsic motivation (Hung, Huang, & Lin, 2008). In Hong Kong, Hui (2015) reported a large-scale study involving 1729 Hong Kong adults, which showed that psychological factors together with cultural factors explained a significant variance of 44% in predicting CSE. In addition, cultural factors were found to mediate the effects of psychological factors on CSE.

CSE as Control Variable or Mediator

In parallel to these studies, more studies examined CSE as a control variable or mediator. Tang and Ding (2014) studied 930 graduates' behaviors in the professional virtual community (PVC) in China and found that dimensions of students' PVC behavior significantly predicted their creativity after controlling the effect of intrinsic motivation and CSE. In the Taiwanese study mentioned earlier (Hung et al., 2008), the researchers also tested the mediating effect of CSE between feedback and creativity and found that CSE and motivation mediated the effect of significant others' feedback on students' creativity. A partial mediating effect of CSE was also found between thinking styles and artistic creativity among Chinese art students (Li & Liu, 2014) and between optimism and innovative behavior among Taiwanese undergraduates (Li & Wu, 2011). With a sample of primary school pupils, Wang, Zhang, Chu, and Liu (2009) found a significant positive correlation between CSE and creativity ($r = 0.23$). CSE completely mediated the relationship between family environment and the creative tendency. In particular, the knowledge dimension of the family environment enhanced the CSE of pupils, which in turn increased the creative tendency of the kids.

Developmental and Demographical Analysis of CSE

China is a huge country with the world's largest population. The fast growth of economy for the past decades has brought great changes and caused substantial differences between different generations and regions. During recent years, some educational psychologists in mainland China have started to investigate the variations in CSE and their accounts among Chinese across age, gender, and regions.

Using the CSE instrument of Hung and Lin (2004), Li and Wang (2011) measured the CSE of 656 seventh- to ninth-graders in three different provinces of China. Overall, girls reported their CSE higher than boys, particularly in their self-belief in coming up with creative strategies. No significant differences were found in their self-beliefs in producing creative products and withstanding negative evaluation. This study also found that the seventh-graders rated their CSE significantly higher than the eighth- and ninth-graders. Studies about college students' CSE issued

somewhat conflicting results: Yang (2007b) found no difference between male and female undergraduates in their CSE, whereas He (2014) found higher CSE among male graduates. Similar to the results with high school students, undergraduates from lower grades also scored higher in CSE than those from higher grades (Yang, 2007b). This tendency was reversed with older students in that graduates from a higher grade reported higher CSE (He, 2014). Whereas Yang (2007b) observed some differences between humanity and science and engineering students in some subscales of CSE, no differences in CSE between sciences/engineering and liberal arts graduates were found in He's (2014) study.

Beghetto (2006) noted students' SES as one of the correlates of middle and secondary school students' CSE in the USA. Karwowski (2011), with a large Polish middle school student sample, also confirmed this relationship. Chinese studies revealed consistent results: pupils from more developed regions rated their CSE significantly higher than those from the less developed regions (Li & Wang, 2011) and graduate students from the "211 Project" (Chinese: "211 工程")[b] universities showed higher CSE than those from the key universities at the provincial level (He, 2014).

It is worth mentioning that results of these studies need careful interpretation, as they used different measures of CSE and the comparability of the measures was not examined. Therefore, unless developmental and demographical analyses of CSE using comparable instruments are available, it would be premature to make any conclusions about the influence of gender, age, and SES on CSE.

CSE STUDIES IN ORGANIZATIONAL CONTEXT

Overall, more CSE studies have been carried out in organizations than in educational settings using Chinese samples (Tables 13.1 and 13.2). In spite of this, unlike their colleagues from the educational field, Chinese organizational psychologists are reluctant to develop their own instruments to assess CSE. All the studies we reviewed have used the CSE instruments of Tierney and Farmer (2002) or Carmeli and Schaubroeck (2007). None of them have developed and used their own CSE scales. Similar to the case in the educational field, CSE in Chinese workplaces has been studied as an independent variable, a mediator, or a moderator, with most of the studies treating CSE as a mediator.

[b]The "211 Project" was initiated by the Ministry of Education of P. R. China in 1995 with the intent to establish (approximately) 100 best Chinese universities in the 21st century. Such universities get extra financial and developmental support from the government. To date, there are only 112 (4.3% of total) universities selected as "211 Project universities" in China.

CSE as an Independent Variable

Studies in organizational context also provided evidence to the predictive effect of CSE on employees' innovative behavior and this positive link was found being moderated by personality traits, such as optimism (Hsu, Hou, & Fan, 2011) or cognitive factors, such as knowledge sharing (Sun, Yang, & Zhang, 2012). With a sample of more than 400 Chinese employees, Gu and Peng (2011) found that the positive effect of CSE on creative behavior was mediated by achievement motivation and work involvement.

CSE as a Mediator

As one core part of an individual's subjective perception, CSE can have effective mediating effect on an individual's psyche and behavior and indirectly affect individual creative behavior (Ye & Lin, 2012). The indirect influence of CSE on employees' innovative behavior has been tested and confirmed with predictors related to organizational culture, leadership, job characteristics, and personal attributes. At the organizational level, it has been found that CSE fully mediated the relationship between organizational culture (i.e., high-agglomerative culture, market-oriented culture, hierarchical culture, etc.) and employee innovative behavior (Yang, Yang, & Sun, 2012) and partially mediated the positive relationship between the organizational error management culture and creativity (Du, Jia, & Ni, 2015). A knowledge sharing culture had an effect on employee innovation also through the effect of CSE (Hu & Zhao, 2016). In terms of leadership, it has been found that CSE mediated the positive relationship between various leadership styles and employee creativity, such as the transformational leadership (Gong, Huang, & Farh, 2009), the supportive supervision (Hong & Wang, 2011), as well as the ethical leadership (Wang & Ye, 2015). Various job demands or characteristics also lead to employees' creativity through the effect of CSE. Hong and Wang (2011) found that for knowledge workers, the job complexity together with supportive supervision could predict their creativity through the mediating effect of CSE. For employees from different domains, if they were explicitly demanded to solve problems differently, they also exerted more creativity through the mediating effect of CSE (Zhou, Hirst, & Shipton, 2012). CSE also plays a mediating role between the fair appraisal system (pay for performance) and employees' innovative behavior (Zhang & Long, 2013). While mediating the effect of external attributes on creativity, CSE has also been found to mediate the effect of personal attributes on creativity. Critical thinking has long been regarded as an antecedent of creativity (Paul & Elder, 2006). However, this positive link cannot be taken for granted without taking self-belief attributes into consideration. Indeed, Jiang and Yang (2014) found that CSE fully mediated the positive relationship between critical

thinking and employee creativity. With a sample from Taiwan, Gong et al. (2009) found that insurance agents' learning orientation and transformational leadership of their leaders were positively related to their creativity, and these relationships were mediated by the CSE of the employees.

CSE as a Moderator

The moderating effect of CSE has been tested particularly when job insecurity is considered as one factor that might influence employees' innovative behaviors. Zhou and Long (2011) examined the influence of job insecurity and intrinsic motivation on creativity and found that the effect of job insecurity was stronger for employees with lower CSE. Whereas intrinsic motivation mediated the relationships of job insecurity and CSE to creativity, the effect of job insecurity on creativity was moderated by CSE. With a larger sample of employees from various domains, Yang and Zhang (2012) examined the effect of job insecurity and team communication on employee creativity. This study revealed that CSE moderated the relationships among team communication, job insecurity climate, and innovative behavior such that the effect of job insecurity was stronger for employees with lower CSE and the higher the CSE of the team, the smaller the impact of team communication and job insecure atmosphere on the team creativity is. Shin, Kim, Lee, and Bian (2012) examined the relationship of team diversity, CSE, and creativity and found that team members' CSE moderated the relationship between cognitive team diversity and individual creativity in that this relationship was positive only when CSE was high. Qu and Kang (2014) found that CSE moderated the relationship between transformational leadership and creativity and between contingent-reward leadership and creativity. That is, both transformational leadership and contingent-reward leadership had more impact on creativity for the employees who had lower CSE.

CSE OF THE CHINESE IN COMPARISON TO OTHER CULTURES

Markus and Kitayama (1991) maintained that self-phenomena might vary according to the culturally influenced relationship of self with others. Indeed, cross-cultural studies about efficacy beliefs have shown that, overall, people from collectivist cultures have significantly lower efficacy about their abilities than those from individualist countries, although their actual academic or business performances are not necessarily lower than their individualistic counterparts (for a review, see Klassen, 2004). This conclusion, however, is mainly based on speculations rather than empirical evidence, as most of the studies reviewed haven't included

measures of cultural dimensions. To fill this gap, Tang, Karwowski, and Hu (2016) compared the college students from China, Germany, and Poland in cultural orientations and CSE. In order to control the reference-group effect (Heine, Lehman, Peng, & Greenholtz, 2002) that plagues the cross-cultural studies using only self-report Likert Scales, they employed four decomposed measures of collectivism and individualism based on the horizontal versus vertical social relationships of Triandis and Gelfand (1998)[c] plus one measure of emotion perception in social contexts (Masuda et al., 2008). CSE was measured by the six items of the SSCS instrument of Karwowski, Lebuda, and Wisniewska (In Press). The internal consistencies of these measures are high with all three samples, with Cronbach α of 0.78 for the German sample, 0.86 for the Polish sample, and 0.90 for the Chinese sample.

Interestingly, it was found that the Chinese were not typically collectivistic as most people might think. They showed a clear collective tendency in perceiving emotions, but scored significantly lower in both HC and VC than the Germans. Results for the Germans were consistent, which surprisingly pointed to the collectivistic direction—in both HC and VC, they scored the highest. They also showed a tendency to perceive emotions in a social collective way, although this tendency was statistically not significant. Consistent results were also found for the Poles, which pointed to the opposite direction: they showed clear individualistic tendency to emotion perception and scored the highest in HI. In VI, both Poles and Chinese rated themselves higher than their German counterparts. Although the more collectivistic profile of the young Germans and the more individualistic profile of the young Poles look surprising, other studies have found similar results (e.g., Oyserman, Coon, & Kemmelmeier, 2002; Tang, Werner, & Karwowski, 2016). In terms of CSE, the Chinese students scored significantly lower than their German and Polish counterparts, whereas the ratings of the Germans and Poles did not differ. When CSE was regressed on the cultural variables, no clear relationships were found for the Germans and Poles, as in both countries both individualistic and collectivist measures accounted for more than 10% of their CSE. For the Chinese, all C/I variables accounted for only 7.9% of their CSE, with HI as the only significant predictor. This result is consistent with that of an earlier study with a sample of Chinese high school students, which also

[c]The four measures are as follows: (1) Horizontal Individualism (HI), those who want to be unique and distinct from groups, but are not particularly interested in becoming distinguished; (2) Vertical Individualism (VI), those who want to become distinguished and acquire status; (3) Horizontal Collectivism (HC), those who see themselves as being similar to others and emphasize common goals, interdependence, and sociability; (4) Vertical Collectivism (VC), those who emphasize the integrity of the in-group, and are ready to sacrifice their personal goals for the in-group goals.

found that individualistic value was better than collectivistic value as a predictor of CSE (Tan et al., 2013). No gender differences were found in CSE in neither of the samples. Taken together, results of this study add to the scanty literature about the comparison of CSE across cultures and suggest that also in the self-efficacy specifically related to creativity, the Chinese people tend to rate themselves lower (cf., Klassen, 2004). However, I/C dimensions alone don't lend sufficient and helpful explanations to this finding. Culture is a rich and dynamic concept, dichotomous cultural labels (e.g., individualism vs. collectivism) usually oversimply rich and complex cultural differences (Tweed & Lehman, 2002). Future cross-cultural studies should also include other sociocultural factors, such as Confucianism (Kim, 2007; Niu, 2012), worldview (Nisbett, 1998), and relational theory in creativity (Hui, 2015) in exploring and explaining the cultural differences in CSE.

FUTURE STUDIES

Based on the previous review, we would like to identify some directions for future CSE studies in Chinese societies. First, our comprehensive review does not reveal a special Chinese conceptualization and measurement of CSE, as the Chinese scholars mainly apply or adapt the definitions and instruments from the West to their studies. The long history, unique ideological system, and the fast modernization process make China a very complex and interesting country. Any direct "transplantation" of Western theories and instruments to the study of creativity in China will inevitably raise the validity concern and can lead to the problem of "distortion of reality" (Rudowicz, 2003, p. 286). Therefore, efforts should be made to carry out indigenous studies to help us better understand the antecedents of CSE and its influence on creative behavior. In the educational field, studies have been conducted to operationalize and develop specific measures to assess CSE among students (e.g., He, 2014; Hung & Lin, 2004; Tan, 2007). Such endeavors should be continued and synthesized so that we can have more contextualized rather than general measures of CSE. In the organizational field, it is imperative to first cross-validate the CSE instruments developed with US samples to Chinese samples before further employing such measures in creativity studies in Chinese societies. Klassen (2004) warned that "Removing the context from self- or collective efficacy assessment removes much of the relevance and productiveness of the (CSE) construct" (p. 227). One way to develop more contextualized measures would be to adopt a multidimensional rather than one-dimensional design to decompose CSE according to the specific cultural and contextual features. Another way would be to describe real-life scenarios for specific CSE measures. By doing so, we will also increase the authenticity and ecological validity of the instrument.

Second, given the important role that culture plays in shaping one's self concepts, it is surprising to see the scant literature about the cross-cultural studies on CSE. This poses a definite gap in the literature that should be filled by future studies. Before carrying out cross-cultural studies on CSE, steps should be taken to systematically test the structural and metric invariance of the instruments in the designated cultures (Karwowski, 2016). A variety of psychological, semantic, and operational factors should be taken into consideration to minimize the methodological pitfalls that cross-cultural studies are prone to. For example, people of different cultures tend to use self-report Likert scales in different ways. Whereas Japanese and Chinese students are more likely to answer toward the center of a scale, American and Canadian students are more inclined to use scale extremes (Chen, Lee, & Stevenson, 1995). The "modest bias" may lead the Asian people to rate themselves lower on self-measures, such as self-esteem (Kagitcibasi, 1997). The translation and back-translation process should be double-checked to eliminate the variation of the meaning of measures in different cultures (Brislin, 1970). The reference-group effect (Heine et al., 2002) deserves special attention when only self-report Likert scales are used for cross-cultural comparisons.

Third, Bandura (1997) claimed that "people guide their lives by their beliefs of personal efficacy" (p. 3). Considering the strong influence of culture on one's perception of self, Klassen (2004) argued that "these claims may not apply to some collectivist individuals in some collectivist settings … some people (in some contexts) guide their lives by their beliefs of collective efficacy" (p. 228). Although Chinese measured by self-report Likert scales do not show typical collectivist orientation (Tang et al., 2016a, 2016b), this result might be due to the methodological confounds of the instrument (Heine et al., 2002). The fact that the Chinese still score the highest in collective emotional perception shows that the Chinese culture is still an interdependent culture. In such a culture, it makes sense to also look at the efficacy beliefs at the group level. Recent years have seen a growth of creativity studies at the team level and some of these studies have started to take team creative efficacy into consideration. For example, Shin and Zhou (2007) found that transformational leadership and educational specialization heterogeneity interacted to affect team creativity and that team creative efficacy mediated this moderated relationship among educational specialization heterogeneity, transformational leadership, and team creativity. Hon and Chan (2013) found that team task interdependence strengthened the direct effects of empowering leadership on team self-concordance and team creative efficacy, as well as its indirect effect on team creativity. Future studies of CSE in Chinese societies should dig deeper into the effect of CSE and creative collective efficacy and the possible interaction between these two constructs in their effect on individual or group creativity.

Last but not least, in line with the recommendation of Anderson, Potočnik, and Zhou (2014), we would call for more multilevel studies on creativity taking CSE into consideration. With analyses at multiple levels, we are able to go deeper into the complex system of creativity and innovation and unveil the interaction and mechanism between individual, team, organization, and environment. For example, in reviewing the literature about CSE studies in workplace, we have repeatedly seen the studies about leadership, CSE, and creativity at individual, team, or organizational level. What is the exact role of leadership and leader–member exchange in creativity? Shin et al. (2012) approached this question by adopting a multilevel design and revealed rich results: cognitive team diversity was positively related to individual creativity only when self-efficacy of individuals was high, and cognitive team diversity was positively related to team member creativity only at high levels of team transformational leadership. Given the complex nature of creativity and innovation, this approach presents particular promise to uncover and elucidate processes underlying innovation (Anderson et al., 2014). Therefore, more studies taking a multi- or across-level approach are needed for future creativity and innovation studies, including studies taking CSE into consideration.

CONCLUSIONS

CSE as an important correlate of creativity has been widely studied in both educational and organizational contexts in Chinese societies. Numerous studies have appeared to examine CSE as an independent variable, a mediator, a moderator, or a dependent variable. Other constructs examined together with CSE range from *organizational* (e.g., organizational culture, leadership, appraisal), *environmental* (e.g., family environment, pressure, feedback, SES, knowledge sharing), and *job characteristics* (e.g., job complexity, problem-solving demand, team diversity, team communication) to *personal* factors (e.g., motivation, optimism, thinking style, job satisfaction, job insecurity). Therefore, the contributions of the Chinese scholars hold a substantial part in the existing literature. Despite this, the study design that the Chinese scholars use resembles dramatically those from the West. As a result, a typical Chinese perspective of CSE is yet to form. More indigenous, cross-cultural, and multilevel studies are called for with the aim to help us better understand the role CSE plays in the creative mechanism in Chinese societies.

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Why You are Probably More Creative (and Less Creative) Than You Think

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On July 19, 2010, *Newsweek* magazine ran a cover story titled "The Creativity Crisis." Beneath this foreboding, large block-print title, a subtitle explained the nature of the crisis: "For the first time, research shows that American creativity is declining. What went wrong—and how we can fix it." The story's focus was a study by Kim (2011c) showing that scores on some of the subtests of one of the two Torrance Tests of Creative Thinking had declined since 1990.

This sounds ominous. Creativity matters for lots of reasons—for dealing with world problems of all kinds (e.g., global warming, terrorism, poverty), for the economy (humans do not live by bread alone, but that doesn't mean economic productivity isn't important), and (perhaps most important of all) for the great joy that creativity brings into each of our lives. So a "Creativity Crisis" would indeed be important news, something that belongs on the cover of *Newsweek*—if it were true. But "The Creativity Crisis" storyline is nonsense, and understanding why it is nonsense will help explain why you are probably both more creative and less creative than you think.

I often ask my students to rate their own creativity on a scale of 1–10. The highest rating of 10 goes to the most creative people of all time—people like Muraski Shikibu, the nickname by which we know the Heian poet and lady-in-waiting who wrote the world's first modern novel approximately 1000 years ago, or Albert Einstein, who completely upended

our Newtonian understanding of our universe approximately 100 years ago. (Newton, of course, would also be a 10, but if you're reading this book, you cannot be a 10. The rule is that 10's can be awarded only posthumously, so if you can actually do a self-rating, then you're too alive to be a 10.) The lowest rating of 1 goes to the most boring rock one can imagine, one even a geologist couldn't love (so, once again, ratings of 1 are impossible as long as one is breathing).

This exercise makes several points, such as the fact that creativity isn't a dichotomous yes-or-no kind of thing but rather a continuum, a gradient in which one can be more or less creative but not simply creative or uncreative. My students are generally able to settle (privately) on a number rather easily until I ask, "Does it matter if I specify the area of creativity, such as creativity in poetry, mathematics, art, or science?" That's when the single 1–10 creativity scale totally breaks down.

There are problems with self-assessments, of course, and creativity self-assessments have been shown to be especially problematic (see, e.g., Brown, 1989; Dollinger, Burke, & Gump 2007; Pretz & McCollum, 2014; Reiter-Palmon, Robinson, Kaufman, & Santo, 2012; Rowe, 1997; Silvia, Wigert, Reiter-Palmon, & Kaufman, 2012). Kaufman, Evans, and Baer (2010), for example, found that fourth-grade students' creativity did not at all match the assessments of experts of actual products the students had created in the domains of math, science, writing, and art. And the problem wasn't that the students just gave themselves unrealistically high ratings in all areas—the students didn't simply inflate their self-assessments across the board. Their self-assessments varied, high in some domains, low in others, but those self-assessments simply bore no relationship to the ratings experts made of their actual creative products. It was as if the ratings they had given themselves had been done randomly.

But the problem with the 1–10 creativity rating scale isn't only the lack of validity of such self-assessments. The problem, which my students discover as soon as I ask the "Does it matter if I specify the area of creativity?" question, is that even if one could accurately rate one's own creativity, the rating would depend crucially on the domain because the evidence for domain specificity in actual creative performance is overwhelming. One might be very creative in art but not at all in science, or vice versa (or one might be very creative, or not creative at all, in both domains—creativity in one domain tells us nothing about creativity in other domains, so lack of creativity in one domain doesn't make creativity in any other domain either more likely or less likely). The more domains one adds (including nonacademic domains, e.g., cooking, solving interpersonal problems, and baseball coaching strategies), the more the domain specificity question looms large. There are certainly polymaths—people like Leonardo da Vinci who are highly creative in several domains—and domain specificity theory predicts that there will be some (but only a small number) of true

polymaths. But no one is creative in all domains.[a] (I have it on good authority that Leonardo's cooking and dancing were hardly creative at all.)

So why did *Newsweek* decide that there was a "Creativity Crisis?" Their article, it turns out, was based on research showing a decline, over several decades, in scores on some of the subtests of one widely used measure of divergent thinking (Kim, 2011c). Divergent thinking is the kind of thinking one does when asked to think about things such as listing many interesting uses for a brick, and it is hypothesized, based on Guilford's (1956, 1968) Structure of the Intellect model, to be an important contributor to creative thinking. So a reported decline in divergent thinking, as measured by one divergent-thinking test, was said to indicate a general decline in creativity. It should be noted that this alleged decline in general creativity was based on Kim's (2011c) study of scores on some of the subtests of the Torrance Test of Creative Thinking, Figural Test, which is one of two Torrance Tests that has been used (with periodic changes to the scoring systems) since 1966. Several serious validity problems with this test are discussed in the subsequent text, but it should also be noted that, even were the test a valid one, the effect sizes Kim reported were uniformly small, and the largest declines reported were in a group that typically has the most fluid and unstable scores (kindergarten through third grade; Hampson & Goldberg, 2006). With the huge sample (almost 275,000 test scores), many of the comparisons did achieve statistical significance despite the small size of the reported effects.

Guilford's Structure of the Intellect model proposed that what he called "divergent production"—thinking of a wide variety of ideas in response to an open-ended question or prompt—was a significant contributor to creativity (Guilford, 1956, 1968). In defining divergent thinking (a term Guilford also used and the more commonly used term today), Guilford contrasted divergent thinking with convergent thinking:

> In convergent-thinking tests, the examinee must arrive at one right answer. The information given generally is sufficiently structured so that there is only one right answer …. [A]n example with verbal material would be: "What is the opposite of

[a]Domain specificity does not ignore the importance of interdisciplinary thinking and problem solving, but interdisciplinary thinking, whether done by one person with expertise in multiple domains or by a team of people with diverse areas of expertise, requires disciplinary knowledge in more than one domain. Interdisciplinary thinking does not mean thinking that ignores or eschews disciplinary expertise. Expertise, of course, is very domain specific. To become an expert, one must work or study in a domain, typically for a rather long time (although how long it takes to require expertise varies by domain), and there is little reason to expect that one's expertise in a given domain will transfer readily to other domains. One may sometimes need to combine expertise gleaned in multiple domains to solve problems in an interdisciplinary way, but to do so one first needs disciplinary expertise (Baer, 2015b).

hard?" In divergent thinking, the thinker must do much searching around, and often a number of answers will do or are wanted. If you ask the examinee to name all the things he can think of that are hard, also edible, also white, he has a whole class of things that might do. It is in the divergent-thinking category that we find the abilities that are most significant in creative thinking and invention. *Guilford (1968, p. 8)*

Guilford's Structure of the Intellect Model has little impact on thinking about intelligence today (Carroll, 1993). It was an interesting, complex, and intuitively appealing model, but one that has actually had little impact on our current understanding of intelligence or cognition. Today one is likely to encounter it only in History of Psychology courses (or perhaps in an Introduction to Psychology textbook, where Guilford's intricate three-dimensional depiction of the model might appear as a way station along the path to current theories of intelligence). As one commentator wrote:

> Guilford's SOI model must, therefore, be marked down as a somewhat eccentric aberration in the history of intelligence models; that so much attention has been paid to it is disturbing, to the extent that textbooks and other treatments of it have given the impression that the model is valid and widely accepted, when clearly it is not. *Carroll (1993, p. 60)*

The idea of divergent thinking, however, remains influential in the area of creativity assessment, but divergent thinking is now mostly divorced from Guilford's larger model and its 120 (or 150 or 180, depending on the version of the theory) elements.[b]

Divorced from its roots in the Structure of the Intellect model, divergent thinking has come to have a very influential post-Guilford life of its own. Divergent thinking is widely taught in creativity-training programs (e.g., Baer, 1997; Baer & Kaufman, 2012; Eberle & Stanish, 1980; Micklus, 2006; Parnes, 1992; Talents Unlimited, 2015; Treffinger, 1995), and it is what the most widely used tests of creativity—the Torrance Tests of Creative Thinking—actually try to measure[c] (Kim, 2011a, 2011b, 2011c; Long, 2014; Torrance & Presbury, 1984).

The Torrance Tests of Creative Thinking are actually two very different sets of tests with items coming from two different domains, verbal and

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[b]Guilford's original model had just 120 components before he separated Figural Content into separate Auditory and Visual contents. When he separated Figural into Auditory and Visual contents, his model increased to 150 categories, and when Guilford later separated the Memory functions into Memory Recording and Memory Retention, his model finally increased to 180 factors (Michael, 1999).

[c]The Torrance Tests do not include any other parts of Guilford's Structure of the Intellect, including the different Contents or Products that resulted in 30 different types of divergent thinking in Guilford's final model.

figural. Both measure divergent thinking, and both are generally inter-preted as domain-general measures of divergent-thinking skill (and by extension of creativity), but the two versions of the test employ different domains in their test exercises. Both versions of the test have been around for a half century, although they have undergone many modifications during that period, especially modifications to the scoring rules.[d] Because the two versions of the Torrance Tests are understood by most users to be measuring the same general construct (Scholastic Testing Service, 2015), one would naturally expect the scores on the two tests to be highly cor-related, but this is not what even Torrance himself found. In fact, Tor-rance discovered that the two tests were almost completely orthogonal, correlating at the level of 0.06 (Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005)—which is to say they are not correlated at all and are essen-tially measuring two discrete and unrelated skills. (Imagine a company in the business of producing IQ tests that sold two different IQ tests that were considered interchangeable for research in the area of intelligence. If, according to the company itself, the two IQ tests correlated at just 0.06, would anyone trust those tests?)

So if scores on one of the Torrance Tests of Creativity—either the figural or the verbal test—declined, would one expect a similar decline in the other? Not at all. The complete lack of correlation between the two tests would give no indication, based on a decline in one set of scores, that scores on the other test would have been likely to have declined during the same period. Scores on the other version of the test would be equally likely to have increased (or they might have remained unchanged). And were divergent thinking measured in some third or fourth domain—if someone developed a measure of divergent thinking in architecture, and

[d]Torrance (1966, 1974, 1990; Kim, 2011c) developed the initial rules for scoring his tests, which he revised many times during the many years of his career. Efforts to improve the scoring procedures are legion: as a reviewer for several journals in the field, I read a handful of new proposals for scoring divergent-thinking tests every year. I believe this ongoing effort to get divergent-thinking tests to work better is a testament to how much these tests have been criticized and how poorly they have performed—and perhaps also (1) to the lack of other simple, easily administered standardized tests that purport to measure creativity and (2) to the historic importance attached to these tests, despite the fact that the tests have been regularly attacked by leaders in the field as invalid measures that are tangential to a real understanding of creativity (as outlined in the text that follows). Each new set of scoring procedure is designed to overcome the problems with all the many previous scoring methods (see, e.g., Benedek, Mühlmann, Jauk, & Neubauer, 2013; Hocevar & Michael, 1979; Kaufman, Plucker, & Baer, 2008; Plucker, Qian, & Schmalensee, 2014; Kim, 2006; Runco & Mraz, 1992; Runco, Okuda, & Thurston, 1987; Sawyer, 2012; Silvia et al., 2008; Silvia, Martin, & Nusbaum, 2009; Torrance, 1966, 1974, 1990).

someone else a measure of divergent thinking in music, for example—one would have no reason to expect a decline (or an increase, or a period of stability with no changes in scores) on any of these tests based on a decline in scores on one or the other of the Torrance Tests.

I have argued for many years that divergent-thinking tests are not good measures of creativity (Baer, 1993, 1993/1994, 2009, 2011a, 2011b). Divergent thinking may be an important creativity-relevant skill in some, possibly many, domains, but because creativity varies by domains, so must divergent thinking. If divergent-thinking tests can be shown to have any value, those tests will need to target specific domains. Simonton (1999) argued that "Generalized tests do not have as much predictive validity as tests more specifically tailored to a particular domain …. Hence, tests of divergent thinking must be tailored to each domain" (p. 86). Sawyer (2012, p. 58) came to a similar conclusion:

> There may be some bit of real-world creativity that could be predicted by a hypothesized construct of general creativity, but that bit is much smaller than the domain-specific component. And that's probably the reason why creativity tests haven't been overwhelmingly successful: if there's no such thing as domain-general creative ability, then no general creativity test could ever be successful.

Although still widely used in schools, where there is a desperate need to find measures other than IQ or standardized achievement tests to select students for gifted/talented programs, divergent-thinking tests such as the Torrance Tests are no longer so overwhelmingly favored as measures in creativity research as they once were. In a 1984 review of all published creativity research, the Torrance Tests accounted for three-quarters of all creativity research involving students and 40% of the smaller subset of all creativity research involving adults as subjects (Torrance & Presbury, 1984), but times have changed. I have no current data on divergent-thinking test use in research similar to the Torrance and Presbury's (1984) study, but consider what the leading theorists in the field have been saying about divergent-thinking and domain-general creativity testing in the 35 years since those data were collected:

- In 1981, Barron and Harrington wrote that "DT tests have often failed to correlate significantly positively with plausible indices of creative achievement and behavior" (p. 618).
- In 1983 Amabile discussed the Torrance Tests and other divergent-thinking tests and wrote that "problems with creativity tests could hamper any empirical application. … the construct validity (concurrent and predictive) of many tests has been seriously questioned" (p. 25).
- In 1985 Sternberg wrote that "such tests capture, at best, only the most trivial aspects of creativity" (p. 618).

- In 1999 Simonton wrote that "tests of divergent thinking must be tailored to each domain" (p. 86) and in 2003 added that "scores on separate creativity tests often correlate too highly with general intelligence (that is, low divergent validity), correlate very weakly among each other (that is, low convergent validity), and correlate very weakly with objective indicators of overt creative behaviors (that is, low predictive validity)" (p. 216).
- In 2004, Plucker, Dow, and Beghetto wrote that "theorists over the past 20 years have moved toward a more inclusive model of creativity in which divergent thinking plays an important but small role" (p. 85).
- In 2006 Gardner wrote that "creativity in physics turns out to be quite different from creativity in poetry or physics or psychology. Generalizations about creativity are destined to be weak; the devil lies in the details about the creative domain in question" (p. 67).
- In 2009 Kaufman wrote that "these tests' reliance on this singular concept [domain generality] is one reason that other creativity assessments have gained favor over the past decade" (p. 82).
- In 2012 Sawyer wrote that "after over 50 years of DT test study, the consensus among creativity researchers is that they aren't valid measures of real-world creativity" (p. 51).

Sawyer's (2012) conclusion that creativity researchers had come to consensus on the judgment that divergent-thinking tests simply aren't valid measures of creativity came just 3 years after the American Psychological Association's Division 10 (*Psychology of Aesthetics, Creativity, and the Arts*) held its first-ever debate. The topic of that debate was the question, "Are the Torrance Tests Still Relevant in the 21st Century?" (Baer, 2009; Kim, 2009; see also Baer, 2011a, 2011b; Kim, 2011a, 2011b, for a follow-up written version of the same debate that was solicited by the APA journal *Psychology of Aesthetics, Creativity, and the Arts*).

Divergent-thinking testing is still with us (hence the misleading *Newsweek* cover story), but its role is much reduced in creativity research and the need to use it only for domain-specificity testing (and conclusions) is widely recognized (albeit not by *Newsweek*).

The entire "Creativity Crisis" was, in fact, based on a decline in some subtest scores on one—just one—of the two Torrance Tests (and because there is no overall "Creativity Crisis," it really doesn't matter which of the two tests showed a decline in scores[e]). All that we know is that a test

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[e]For readers who must know, it was the figural test, not the verbal test (Kim, 2011c). This is (perhaps) interesting because in the most recent review of Torrance Test long-term validity data (Plucker, 1999), the figural test didn't predict creative achievement, but the

that measures divergent thinking in one domain declined. Did divergent thinking in other domains decline? We don't know. Did actual creativity decline during this period? That's a far more important question than whether or not divergent-thinking test scores went up or down, and in fact we do know something about actual creative performance during roughly the same period of time as the reported decline in scores on one of the Torrance Tests. The answer is surprisingly interesting—and it will also show us why your creativity is probably both greater and less than you think. To understand that answer, we need first to consider how creativity—actual creativity, not a skill like divergent thinking theorized to contribute to creativity—can be assessed.

There are ways to measure creativity, some of them very good. The best—sometimes called the "gold standard" (Carson, 2006)—is the Consensual Assessment Technique. The Consensual Assessment Technique is a method of assessing creative performance (actual creative performance on a real-world task such as writing a poem, creating a collage, and inventing a mathematical puzzle) that was originally developed by Amabile (1982, 1983, 1996) and further developed by others (e.g., Baer, Kaufman, & Gentile, 2004; Hennessey, Kim, Guomin, & Weiwei, 2008; Kaufman, Baer, Cole, & Sexton, 2008). It can be used in virtually any domain[f] and is

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verbal test did. As it happens, the criteria used to assess actual creativity in that study were in many ways problematic, including the fact that they relied on self-report data, which are known to have little relationship to actual creative performance (as explained elsewhere in this chapter, but see Baer, 2015a, for a full critique of other problems with these data). Even if one accepts the questionable criteria used for assessing real-world creativity, however, one is struck by the fact that the verbal divergent-thinking tests predicted creative performance, but the figural tests (the one on which the "Creativity Crisis" story was based) did not. This becomes easier to explain when one looks at the types of self-assessments used in the study, however, which came primarily from the verbal domain. As the author of the study explained:

> The importance of verbal DT relative to figural DT may be due to a linguistic bias in the adult creative achievement checklists. For example, if a majority of the creative achievements required a high degree of linguistic talent, as opposed to spatial talent or problem solving talents, the verbal DT tests would be expected to have a significantly higher correlation to these types of achievement than other forms of DT. *Plucker (1999, p. 110)*

That is, creativity was linked to divergent-thinking test scores in the domain where the test and the criteria came from the same domain, but no linkage was found when they came from different domains. There's a term for that: domain specificity.

[f]This includes not only what one might consider academic domains such as astronomy and cosmology but also nonacademic domains such as astrology and cosmetology—although with different panels of experts, of course. The Consensual Assessment Technique

modeled after the way creativity is assessed at the highest level in most domains: by panels of experts. When the Nobel Prize in literature was being decided, no one asked for my vote; ditto for the Fields Medal in mathematics. It was the opinions of experts in the relevant domains that mattered. The collective judgment of recognized experts (who in the case of the Consensual Assessment Technique work entirely independently of one another) is simply the best measure available of the creativity of a poem, collage, puzzle, or any other product at a given point in time (expert opinion may change over time, of course, so what is creative—as far as anyone can quantify creativity—may also change over time). The ratings of experts (and it is important to use experts, which is the basis of the validity claims of the Consensual Assessment Technique) tend to be quite consistent, with coefficient alpha interrater reliabilities typically in the 0.80–0.90 range (Amabile, 1982, 1983, 1996; Kaufman, Baer, & Cole, 2009a, 2009b; Kaufman et al., 2008a; Kaufman, Baer, Cropley, Reiter-Palmon, & Sinnett, 2013).

Assessments of actual creative products using the Consensual Assessment Technique have consistently found that creativity is very domain specific. Creativity in one domain is not at all predictive of creativity in other domains. (It is predictive of creativity on other tasks in the same domain, however, even over extended periods of time. Creative performance is consistent *within* a domain, and even within a domain, the more similar the tasks, the higher are the correlations between creativity ratings.) These studies show that there are some people who are creative in many domains, some in very few, but, overall, the correlations between creativity ratings across domains hover pretty close to zero (see Baer, 1998, 2010, 2013, 2015a, for summaries of this research). Being creative isn't one thing. It's many things.

It happens that a long-term study was conducted that parallels the research behind the *Newsweek* "Creativity Crisis" cover story—spanning almost exactly the same time period—but rather than look at scores on one test of divergent thinking in one domain, this study looked at actual creative performance in two domains, creative writing and visual art [reported first in a book (Gardner & Davis, 2013) and soon after in a research report (Weinstein, Clark, DiBartlomomeo, & Davis, 2014)]. "Rather than look at scores on tests of creativity or its correlates (like play), we chose to examine the actual creative productions of young people …. To that end, we conducted an extensive analysis of short

works in the arts as well as the sciences, business as well as politics, sports as well as theology, interpersonal relationships as well as gardening—any place where one might do something creatively (Amabile, 1982, 1983, 1996; Baer, 1993; Baer et al., 2004; Baer & McKool, 2009, 2014; Hennessey et al., 2008).

stories and visual art created by middle and high school students between 1990 and 2011" (p. 130). This included "an extensive analysis of 354 pieces of visual art published over a twenty-year period in *Teen Ink*, a national teen literature and art magazine" (pp. 130–131) and a similar sample of short stories written by middle and high school students during this period.

The authors reported a significant *increase* in the creativity of artwork published between 1990 and 2011. This difference was striking and was observed in such things as the ways the artwork was rendered, the composition or balance of each piece, the ways the artwork was cropped, the production practices employed by the artists, and the stylistic approaches used. So rather than a decline—a "Creativity Crisis"—we seem to have just the opposite (a "Creativity Bonanza," perhaps?).

But the creativity of short stories by the same-aged cohort during the same time period did not show an increase. In fact, there was a decline in the creativity of adolescents' writing: "Considered together, these changes in genre, plot, story arc, and time period suggest that, while teens' visual art has become less conventional over time, creative writing emanating from this age group has become more so" (p. 135).

What can we make of this simultaneous rise and fall of creativity in the same cohort of teens in the two domains of visual art and creative writing? In a word (well, two words): *Domain specificity*. Weinstein et al. (2014) titled their research report on this study "A Decline in Creativity? It Depends on the Domain," and in explaining their research design they noted that "there is considerable support for the notion of domain specificity related to creativity" (p. 175). They went on to quote Runco's (2004) *Annual Review of Psychology* entry on "Creativity":

> Runco (2004) suggested that the concept of domains "must be acknowledged because most of what has been uncovered about creativity is domain specific" (p. 678). Further, Runco suggested that considering and elucidating differences across domains is "one of the most important impetuses in the literature" (p. 678). To understand how creativity is actually changing in different domains, it is imperative that research considers the products of those domains (p. 175).

What caused artistic creativity to increase and story-writing creativity to decrease during this time period is beyond the scope of this chapter (curious readers should consult Gardner & Davis, 2013, for some interesting hypotheses). For our purposes, this study tells us two important things: (1) there is no reason, based on declines in scores of one divergent-thinking test, to believe we are suffering a "Creativity Crisis" and (2) when we assess creativity, we need to pay attention to domains.

Domain specificity makes it obvious why most people's self-perceptions of creativity need to be nuanced; creativity self-perceptions need to vary by domain. Single, domain-general self-assessments of

creativity have to be wrong because we need many *different* creativity self-perceptions, one for every domain of interest. But why are those self-perceptions likely to be both too high in some domains and too low in others (i.e., why are most people likely to be both more creative and less creative than they think)? The answer has to do with the validity (or lack thereof) of self-assessments of creativity, even when conducted in a domain-specific way.

As noted earlier, self-assessments in general, and creativity self-assessments in particular, have validity problems, and not simply because people tend to have inflated beliefs about their own abilities. We're just not very good at assessing our own abilities, even ones for which we have had many opportunities to receive objective feedback (which is why Kaufman et al., 2010, titled one of their studies "The American Idol Effect"). Consider self-assessments of intelligence. Most people have received quite a few test scores related to intelligence, so they have lots of objective data with which to work when assessing their own intelligence, but despite all these data, self-assessed intelligence is only moderately correlated (0.30–0.50) with test scores (Chamorro-Premuzic, Furnham, & Moutafi, 2004; Furnham & Chamorro-Premuzic, 2004; Furnham, Zhang, & Chamorro-Premuzic, 2006; Paulhus, Lysy, & Yik, 1998).

If we are poor self-assessors when it comes to things for which we have received a great deal of objective feedback, how likely is it that we're good self-assessors when it comes to areas where most of us have received little objective feedback, such as our creativity in poetry, our creativity in science, our creativity in teaching, our creativity in business, our creativity in art, or our creativity in solving interpersonal problems (to name just a very few domains)? The answer has to be *very* unlikely. So even if the problems with creativity self-assessments catalogued earlier might be due, in whole or in part, to people inflating their ratings to look good—even when we are the most brutally honest with ourselves as we can be—it is unlikely that our self-assessments of creativity in most domains will be very accurate. Some are surely going to be far too low, some others far too high. We are, in many domains, probably more creative than we think, and, in many others, less creative than we think.

Self-perceptions of creativity—and if we want to self-assess our own creativity, we should have many such assessments, one for every domain of interest to us—are probably not terribly accurate. Does this matter? For the most part, not really. We aren't competing when we sketch or write songs or decorate cakes, and the joy we derive from expressing our creativity in most domains is our primary payoff. If we hope to have a career in art or music or cake decorating, however—or if we plan to appear on American Idol—it might be wise to solicit some objective, disinterested feedback from people who are experts in the domain in question and who have no reason to mislead us.

There is of course one other possibility: You may be a creative genius in some domain, the kind of thinker who is creating your own new paradigm and pushing your field in new, previously unexplored directions, which is a kind of creativity that won't be recognized for years or even decades. In such cases, even the current experts in your field might not have enough imagination to recognize your brilliance.

You have my permission (for what's worth) to make that assumption.

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The Creative Self in Context: Experience Sampling and the Ecology of Everyday Creativity

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As this book shows, the concept of a *creative self* lends itself to many lenses. In this chapter, we'll view it through an old lens: the sense of self and identity developed by Allport (1937, 1961), the great personality theorist. Allport's view of selfhood has useful lessons for studying the creative self. He developed a view of people as essentially unique and idiosyncratic, defined largely by personal goals, who were embedded in environments that they typically select and influence. Allport thus sought to emphasize aspects of personality and motivation that are unique and to complicate the seemingly simple distinction between *person* and *environment* (Fleeson, 2004).

This chapter takes an Allportian perspective on everyday creativity—the often humble creative goals people pursue in their normal environments. We propose that *ecological momentary assessment* (EMA) methods, an innovation not available in Allport's time, offer a powerful framework for studying the creative self in context (Bolger, Davis, & Rafaeli, 2003; Conner, Tennen, Fleeson, & Barrett, 2009). By repeatedly assessing people as they go about their normal activities in their typical environments, researchers can illuminate variability in people's actions and environments, examine why a person's thoughts and actions are so variable across a day and week, and discern aspects of environments that shape people's actions.

For creativity researchers, the ability to study creativity naturalistically—people working on their own creative goals at the times and places of their choosing—will offer new insights into what creativity looks like in the real world. After describing the notion of everyday creativity that guides this work, we will review some issues in EMA research and consider its benefits for creativity research. We will then review a small group of studies that have applied EMA methods—particularly experience sampling studies—to understand creativity in natural environments.

NOTIONS OF EVERYDAY CREATIVITY

The notion of creativity in everyday life appears in many conceptions of creativity. The best known comes from the common distinction between Big-C Creativity and little-c creativity. Although coarse, this distinction has been fruitful in clarifying what creativity researchers are interested in. Many approaches to creativity, for example, are primarily interested in Big-C creativity, the study of domain-changing innovations and accomplishments (e.g., Gardner, 1993; Sawyer, 2006). Other approaches, in contrast, are more interested in little-c creativity, the study of how less eminent people come up with new ideas and pursue creative goals (e.g., Finke, Ward, & Smith, 1992; Weisberg, 2006).

The Four C Model (Kaufman & Beghetto, 2009) offers a useful conception of humble, everyday forms of creativity. This model clarifies the traditional distinction between Big-C and little-c creativity and expands to four Cs: *mini-c*, *little-c*, *Pro-c*, and *Big-C*. *Mini-c creativity*, the first c, is the "novel and personally meaningful interpretation of experiences, actions, and events" (Beghetto & Kaufman, 2007, p. 73). Often, everyday creative acts are small adjustments to routine, mundane activities rather than activities done with the intent to be creative. When people have ideas and insights that are "new for them," we see mini-c creativity: coming up with a variation on a recipe, realizing a new route to work, discovering a well-known principle, or construing a problem in a new way. Variation in everyday experiences diversifies opportunities to engage in and apply different perspectives. Mini-c creativity thus emphasizes interpretive and transformative aspects of thought. Unlike the other C's, it focuses on cognitive acts more than tangible, observable creative products. Nevertheless, the many daily sparks of mini-c creativity are the breeding ground for more public and eminent forms of creativity.

Little-c creativity, viewed within the Four C Model, represents observable creative actions and products, what Kaufman and Beghetto (2009) call "everyday innovation" (p. 2). This category contains most of the creative goals and pursuits of hobbyists, amateurs, children, and emerging

experts: writing songs, inventing new recipes, drawing and sketching, writing poems, learning an instrument, and decorating one's bedroom. Little-c creativity can be striking, but it isn't at the professional level captured by Pro-c and Big-C creativity. Perhaps the most striking thing about little-c creativity is its ubiquity: creative hobbies are widespread among people who don't aspire to a creative profession.

The common nature of creative goals and hobbies is emphasized in Richards' (2007, 2010) model of *everyday creativity*. Richards points out that the ubiquity of creative goals in everyday life says something significant about human nature. People develop and gain meaning from creative expression in their daily lives: they make time for it when they could be doing a million other things. The notion of everyday creativity seems to cover both mini-c and little-c creativity, and it emphasizes the functional role of creativity in human development. Richards suggests that creativity is both a cause and an effect of human flourishing. Doing creative activities increases well-being, and flourishing people naturally seek creative outlets. Creative actions in daily life are thus a cause and a sign of well-being.

Aesthetics research, a close cousin of creativity research, has also emphasized creative acts in everyday life, albeit from a different perspective. Whitfield and de Destefani (2011) advocated for studying what they called *mundane aesthetics*, the artistic and design choices people make in their daily lives. Just as creativity research has focused on eminent Big-C creators, aesthetics research has focused on how people think about and experience landmark works of fine art (Fayn & Silvia, 2015; Silvia, 2012). But most of the aesthetic choices people make are ecological, such as how people make decisions about their hair, clothes, watches, jewelry, furnishings, and wall colors (Whitfield & de Destefani, 2011). These aesthetic choices seem small, but the consequences are important for the people involved. The psychological reasoning involved seems complex, resembling the mini-c and little-c processes identified in the Four C Model (Kaufman & Beghetto, 2009). In short, the mundane aesthetics perspective emphasizes that people make countless creative decisions in crafting how they and others express themselves and experience their environments.

We'll use the term *everyday creativity* to encapsulate all these approaches, both because it is simple and because we find Richards' (2007) emphasis on the functional and motivational aspects of creativity compelling. In our sense of the term, everyday creativity captures the many expressions of creativity that people show in their natural environments, from inner ideas and insights to observable actions. These events might lead to major creative breakthroughs, but they typically don't and aren't important for that reason. Instead, we think that people's humble creative goals are important for their own sake. People invest so much time in creative hobbies that it says something significant about human nature—we are intrinsically creative.

HOW CAN WE STUDY EVERYDAY CREATIVITY?

How can everyday creativity be studied? Ordinary creative actions haven't attracted much attention thus far, but creativity researchers have developed some useful assessment methods. One straightforward approach asks people to rate their involvement in common creative activities. For example, the Biographical Inventory of Creative Behaviors (BICB), developed by Batey (2007), lists 34 different examples of common creative hobbies from a wide range of domains, such as writing a short story, drawing a cartoon, acting, coaching, and cooking. People are asked to indicate whether they have done a behavior in the past year, and they indicate *yes* (1) or *no* (0) to each item. The BICB yields a "creative behaviors" score, which is simply the sum of *yes* responses. The BICB is a popular scale and appears to work well (Silvia, Wigert, Reiter-Palmon, & Kaufman, 2012). The Creative Behavior Inventory (CBI; Hocevar, 1979) asks people to rate how often they have engaged in common creative actions; a popular revised version (Dollinger, 2003) focuses on arts and crafts domains. People rate how often they did each creative item on a 4-point scale, ranging from *Never Did This* to *More Than 5 Times*; the scale yields an overall score. Like the BICB, the CBI has good psychometric properties (Silvia et al., 2012).

Scales such as the BICB and CBI have their virtues, but one weakness is their inadvertent emphasis on breadth. People get high scores by endorsing more activities. The scales thus give higher scores to people who do creative acts in many different domains. Many people, however, have deep instead of broad creative interests. They might be intensively consumed with learning the ukulele, cooking, scrapbooking, or writing, to the exclusion of other creative domains. Even if they spend much of their free time on such creative pursuits, people with only a couple of major creative passions will receive lower scores than people who dabble superficially in many different domains. A second, smaller weakness is the content coverage. People's creative interests can be quirky and idiosyncratic, like people themselves (Allport, 1962), so many creative passions won't be captured by scales that list traditional creative domains.

Another approach, developed by Wolfradt and Pretz (2001), more effectively captures the quirky aspects of people's creative goals. In their project, participants were asked to list their personal hobbies. The hobbies were then rated by judges for their creativity. Some hobbies involved observing (e.g., watching movies or sports) or participating (e.g., reading, playing sports); others involved actively generating new things and ideas. Many of the most creative hobbies will be idiosyncratic, so asking participants to describe their own hobbies is more likely to capture them than standard activity lists.

What these approaches share, however, is an emphasis on stable aspects of people. The participants reflect on their typical or past behaviors and then provide information. The overall scale scores thus reflect typical features of the participants. This is a standard and useful approach for scaling individual differences, of course, but one thing such an approach does poorly is capture contextual variability. When is a person more likely to work on something creative? What contexts evoke and foster creativity? What explains variability in a person's creative motivation across a typical day or week? Understanding things that are variable and contextual requires a different assessment approach—usually known as *EMA* or *experience sampling*—the topic we turn to next.

ECOLOGICAL MOMENTARY ASSESSMENT

The Basic Worldview

EMA is an approach to measurement. It has a long history (see Hektner, Schmidt, & Csikszentmihalyi, 2007) but has caught fire in past couple of decades, largely because of technological and statistical innovations that make EMA research more convenient and accessible. The basic idea behind EMA is to assess the construct of interest repeatedly in people's naturalistic environments. Instead of dragging people into the dusty basement lab and measuring something once, an EMA researcher would assess people frequently while they went about their normal activities in their typical environments.

EMA research can assess anything. Self-report items are by far the most popular, but the method encompasses everything. Popular examples are measuring movement with accelerometers, physiological activity with portable cardiac monitors, ambient light and volume with sensors, the physical environment with small automated cameras, and conversations with clip-on microphones. Our focus, however, is questionnaire methods, which repeatedly present self-report items.

EMA is rooted in some general assumptions about assessment. First, people generally have no idea what they typically do. If you ask people in a lab to describe what they typically eat, how many hours a week they study for classes, their typical mood, or how much TV they watch, they will always give you an answer. But that answer will, at best, be loosely coupled to what really happens. EMA researchers emphasize that people don't encode, attend to, monitor, or count much of what they do in everyday life. When asked questions about their typical experiences and behaviors, then, people will rely on memory and decision heuristics, such as how quickly salient examples come to mind or their beliefs about the kind of person they are. EMA research seeks to get close to the construct by

assessing it as it happens. This reduces the influence of memory and motivational processes that plague cross sectional lab research (Schwarz, 2012).

Second, a person's actions and experience can be highly variable, and this variability is interesting in its own right (Fleeson, 2004). Assessing variability requires many measurement occasions—thus the emphasis on *repeated* assessment in EMA research. For example, people in a lab study can report how many hours they usually sleep per night and how well they typically sleep. But if these people then complete daily sleep diaries for 30 days, enormous within-person variability will appear. Many people will have little variability: from night to night, their sleep is consistent. Others will have some variability, and still others will have volatile patterns of sleep from night to night. Such findings are fascinating. What is the difference between people with consistent sleep and those with volatile sleep? And what explains within-person, day-to-day variability in sleep? What happened on days that were followed by good sleep versus poor sleep (e.g., Flueckiger, Lieb, Meyer, Witthauer, & Mata, 2016)? Likewise, within a day, people's moods can be highly variable, and this variability is predictable from what they are doing and what is happening in the environment. People lack insight into the many subtle correlations between changes in the environment and changes in their thoughts and feelings, so only research that repeatedly assesses both can illuminate subtle effects of context. For example, experience sampling research reveals a diurnal trend in positive moods (Watson, 2000) and finds that most people report feeling happier when other people are around (Burgin et al., 2012), but we doubt that many participants are aware of these influences.

Third, environments themselves are diverse and systematic. They are diverse because people are embedded in such different places during the day. It boggles the mind, really, to consider the range of environments that a large sample of adults might inhabit in a typical week. And the environments are systematic because they reflect, in large part, the influence of the people in them. As Allport (1961) argued, people approach and avoid particular environments, and their personalities and actions in turn shape the environment. For occupations, for example, Holland (1997) proposed that workers and workplaces have the same personality structure because the personality of a workplace environment reflects the personalities of the people who chose to inhabit it. Only by repeatedly assessing people during their normal days can researchers describe people's environments and unravel how aspects of the context influence what people think and do.

Common EMA Designs

The use of EMA designs allows researchers to capture a variety of experiences and can increase the external validity of the research. Traditionally, internal validity has been psychology's primary concern, but EMA

research trades the controlled environment of the lab for the complexity and realism of the everyday situations people find themselves in. Through this switch, EMA research can study the same constructs as lab research but with an emphasis on how they organically occur and vary.

Most EMA research uses one of three common designs. *Daily diary studies* assess people once per day, usually at the end. A weakness of this approach is that people must retrospectively reconstruct their day, and many notable events might be obscured. But this is offset by important strengths. Because the burden on participants is fairly low, researchers can ask a lot of items each day and collect daily reports for a long time, from a couple of weeks to many months.

Experience sampling studies, in contrast, randomly signal people within the day and ask a small set of questions at each signal. People are commonly asked about what they are thinking and doing at the moment of the signal, or what has happened since the last signal (e.g., if they smoked or ate). Experience sampling gets as close to the activity as possible, minimizing recall biases, and it samples enough of the day to afford measuring variability in experiences. A downside is the burden on participants, who are ceaselessly interrupted in the service of science. As the number of beeps per day increases, researchers must ask fewer items and reduce the number of participation days. A daily diary study can go on for months, but an experience sampling study is rarely more than 14 days.

Most experience sampling studies use random signals to sample the behavior. By randomly sampling pieces of the day, researchers can form a snapshot of what someone is actually doing and thinking. A variation is to use an *event-contingent design*. For example, people can be asked to fill out a short survey whenever a predefined event occurs. Event-contingent sampling works best when the event is unambiguous, fairly frequent, and typical for all participants, such as when measuring smoking among participants looking to quit, eating and snacking throughout a day, and social interactions. They are less apt for rare events. For example, some people rarely get chills and goose bumps from music (Nusbaum & Silvia, 2011, 2014), so they would have no data in a study that asked people to fill out a survey whenever they got chills (Nusbaum et al., 2014).

Researchers interested in EMA work will need to befriend multilevel models. Because of the repeated assessments, a study can have several levels of nesting, such as responses to items nested within days, and days nested within participants. The longitudinal quality of the data may also be relevant, such as within-day or within-week trends. Finally, participants usually ignore at least some of the signals or miss some diary days, and the analytic issues raised by complex patterns of missingness can be vexing (Silvia, Kwapil, Eddington, & Brown, 2013; Silvia, Kwapil, Walsh, & Myin-Germeys, 2014a).

THE CREATIVE SELF IN EVERYDAY ENVIRONMENTS

With the basics of EMA methods as a backdrop, this section illustrates some applications of experience sampling methods to the study of the ecology of everyday creativity. Not much research has been done, to be sure, but the handful of studies demonstrates the power of examining everyday creativity in real-world environments. Experience sampling methods are enormously revealing. In the studies we review in the subsequent text, we will both describe some interesting findings and hold up the studies as examples of the kinds of questions that experience sampling allows creativity researchers to ask.

Architecture Students' Flow Experience During Studio Work

Creativity research has a long interest in flow states, which have complex links to feelings of inspiration and creative motivation (Csikszentmihalyi, 1990). The original writings on flow emphasize that it is a state that is closely tied to environments, and early experience sampling work emerged from the study of flow (Csikszentmihalyi, 1975). Since then, however, much of the work on flow has taken a static, cross-sectional view, emphasizing individual differences in proneness to flow. In an illuminating study, Fullagar and Kelloway (2009) examined variability in the experience of flow in a sample of 40 architecture students. They were sampled in an architecture student's natural habitat: the studio. During the course of a semester, the students were randomly signaled during independent studio time to complete questionnaires about their flow experience and emotions while working on their projects. The 40 students provided 1000 responses, an illustration of the massive amount of data that even a small sample can provide.

The intraclass correlation (ICC) is a simple but revealing descriptive statistic in experience sampling studies. Because an outcome is measured repeatedly, the scores vary between people (some people tend to give higher flow ratings overall) and within people (a given person will give higher ratings at some times and lower ratings at others). In this case, the ICC for flow is the proportion of variance in momentary flow experience that is at the between-person level (variation between the participants) versus the within-person level (variation across time points). The ICC for flow was 0.26, so 74% of the variance in flow states during studio time was due to things that varied across studio days. Stated differently, 26% of the variance was associated with differences between people—contextual variation had a much larger influence. Flow thus behaved much more like state concept than a trait concept. This finding nicely demonstrates the wide variability within people that is revealed by intensive assessment (Fleeson, 2004). The essentially situational character of flow during

architecture studio work raises interesting questions about the within-person factors that cause variability in flow states from one point to the next.

Everyday Creativity in Daily Life

Another project examined how often a broad sample of undergraduates engaged in creative actions during a typical day (Silvia et al., 2014b). A final sample of 76 people was signaled 8 times a day for 7 days. The participants were college students, and around one-quarter of them were majoring in the arts. They were signaled by survey software that delivered the items by calling their cell phone (Burgin, Silvia, Eddington, & Kwapil, 2013). At each signal, people were asked whether they were doing something creative (scored simply *No* or *Yes*) and asked to rate their emotional states. The sample completed more than 2300 experience sampling surveys.

This design allowed us to describe what creativity looks like in the daily lives of college students. For example, how often do people engage in creative activities? People said *yes* to the item "Are you doing something creative?" roughly 22% of the time, so creativity was a common part of the participants' days. A natural question, then, is what was different between the times people said they were and they weren't doing something creative? We had measured a wide range of emotions (e.g., *happy*, *sad*, *active*, *anxious*, *angry*), so we examined whether people reported different emotional states when doing something creative. Only two states—feeling *happy* and *active*—differed between times when people were doing creative versus noncreative activities. Notably, these two active-positive states consistently appear in experimental work on mood and creativity (Baas, De Dreu, & Nijstad, 2008). No effects appeared for negative items, such as *anxious*, *angry*, *sad*, *self-conscious*, or *discouraged*, consistent with Richards' (2007, 2010) view of everyday creativity as a cause and consequence of well-being and inconsistent with old stereotypes about suffering and creativity (Silvia & Kaufman, 2010).

Another natural question concerns between-person differences. The overall figure of 22% conceals differences between people, so who was more likely to spend time on creative activities? We measured personality traits before the EMA part of the study, and it was no surprise to find that openness to experience strongly predicted the likelihood that people were doing something creative (McCrae, 1987; Nusbaum & Silvia, In Press). As Fig. 15.1 shows, people near the floor of openness had only a 12% probability of doing something creative, but people near the ceiling had a 40% probability.

This study is a good example of how experience sampling can be used to descriptively characterize a construct. Creativity was fairly common in the everyday lives of our participants, creative times of a
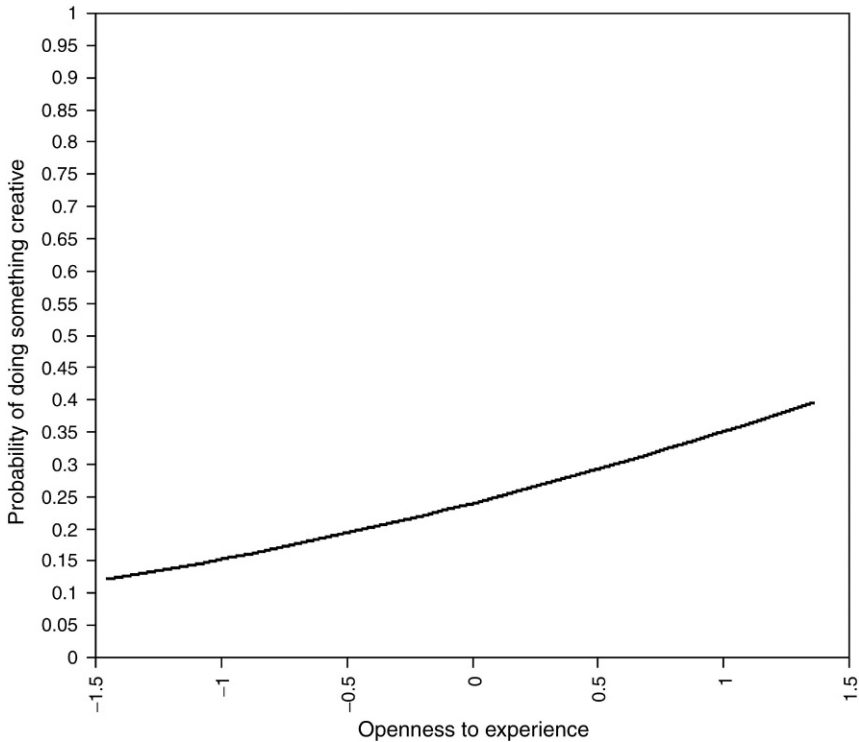
FIGURE 15.1 **How openness to experience predicts the probability of "doing some-thing creative" during a typical day.** *Source: Reprinted with permission from Silvia, P. J., Beaty, R. E., Nusbaum, E. C., Eddington, K. M., Levin-Aspenson, H., & Kwapil, T. R. (2014). Everyday creativity in daily life: an experience-sampling study of "little c" creativity.* Psychology of Aesthet-ics, Creativity, and the Arts, 8, 186.

day were more likely to be positive and active emotionally, and people high in openness to experience were more likely to choose to spend their time on creative projects. In addition, the picture of everyday cre-ativity that emerges offers unique support for the large cross-sectional lab literatures on creativity, mood, and personality: the basic ideas from those literatures are consistent with ecological observations of naturalistic creativity.

What Are Creative Days Like?

Days are another level of analysis. As noted earlier, daily diary studies allow researchers to ask many more questions and to collect data for more days. For creativity research, an interesting question is what "creative days"—days when people devote much of their time to creative pursuits—
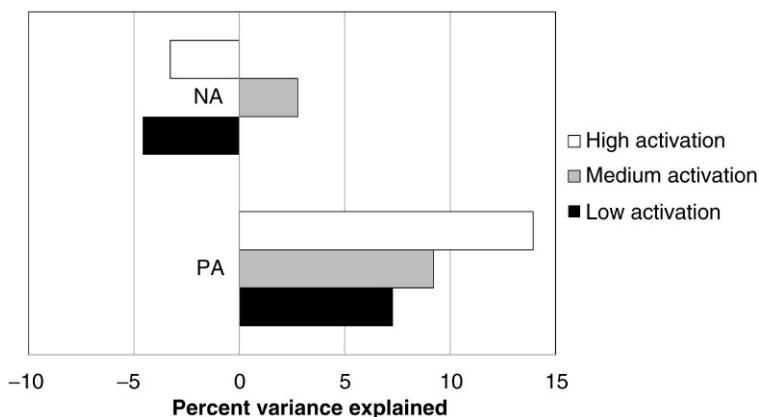
FIGURE 15.2 **The within-person relationship between daily positive affect (PA) and negative affect (NA) and daily creativity.** *Note*: The values are the percent of variance that the PA and NA predictors explained in daily creativity. The sign indicates whether the relationship was positive or negative in direction. *Source: Adapted from data in Conner, T. S., & Silvia, P. J. (2015). Creative days: a daily diary study of emotion, personality, and everyday creativity. Psychology of Aesthetics, Creativity, and the Arts, 9, 467, Table 2.*

are like. In a recent study (Conner & Silvia, 2015), 658 New Zealand college students took part in a 13-day daily diary study that, among many other things, asked "Overall, how creative were you today?" People rated their daily creativity along with a comprehensive set of emotion items, which were crafted to capture both positive and negative valences and high and low activation levels (Watson, 2000).

Daily creativity was associated with daily emotions in interesting ways. As Fig. 15.2 shows, daily positive affective states explained much more variance in daily creativity than daily negative states did. And the largest effect was for high-activation positive emotions (e.g., the items *energetic*, *enthusiastic*, and *excited*), which parallels the finding that within-day creativity was most strongly predicted by feeling happy and active (Silvia et al., 2014b).

The daily diary study included measures of personality traits. As before, openness to experience strongly predicted the typical levels of daily creativity: people high in openness reported days that were more creative across the 2 weeks. Intriguingly, openness to experience and daily positive affect also interacted. The relationship between daily positive affect and daily creativity became increasingly strong as openness to experience increased. Stated differently, daily positive affect and creativity were much more strongly correlated for high-openness people than for low-openness people. It is difficult to disentangle this intriguing effect: people high in openness might get a larger mood boost from creative work, feeling happy

might motivate open people to start doing something creative, or openness might affect third variables that cause positive affect and creativity to covary. But regardless, the finding again supports Richards' (2007) view of everyday creativity as a component of well-being rather than an outlet for anguish and suffering.

CONCLUSIONS

The psychology of aesthetics, creativity, and the arts has a long history of studying experience and activity in natural environments, such as museums, classrooms, rehearsal and performance spaces, and workplaces, to name a few. In this chapter, we sought to develop this ecological approach to the issue of creative selves. As Allport (1961) argued, the self is essentially idiosyncratic: people have a wide range of guiding values and personal goals that direct their everyday activity. And this activity takes place in contexts that people often choose and shape.

Psychology does not handle the unique, as well as it handles the general, as Allport (1962) often remarked, but EMA methods move us closer to the vision that Allport had for studying people. They respect the diversity of people's activities and contexts, and they seek to capture the variety and complexity of psychological processes in the real environments in which they happen. We think that EMA approaches will be enormously fruitful for understanding everyday creativity, the often humble creative activities people do in everyday life. Because people don't usually keep track of what they do or appreciate how aspects of their situations affect what they do, intensive sampling methods can illuminate what everyday creativity looks like in the real world and the kinds of environments that foster and sustain it.

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Leading for Uniqueness: The Role of Uniqueness in Facilitating Creativity in Employees' Self-Concepts

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Being unique is at the heart of creativity, which is typically defined as the production of novel and useful ideas (e.g., Amabile, Conti, Coon, Lazenby, & Herron, 1996). Novelty involves differentiation from convention and thus requires uniqueness in both the process and outcomes involved. Although it has been established that an individual's need for uniqueness is related to creativity (Dollinger, 2003; Kim, Vincent, & Goncalo, 2013), researchers have not fully considered how creativity might be facilitated by building on individuals' need for uniqueness. In this chapter, we consider the role of uniqueness in creativity with particular attention to leaders' role in facilitating creativity through capitalizing on individuals' need for uniqueness. Additionally, we challenge scholars to consider how leaders activating and expecting uniqueness from followers differ from existing leadership approaches that focus on demonstrating consideration for followers with implications for maximizing followers' creativity at work. These two approaches highlight the individuality and uniqueness of followers in different ways, and we believe rich new streams of research can emerge from a sharper distinction between the two approaches.

The need for uniqueness is most often associated with the work of Snyder and Fromkin (1980) who established that individuals strive to maintain a sense of difference from others. This striving is manifested

behaviorally such that an individual who feels a high degree of similarity to another will engage in behaviors that demonstrate his or her differences. Although individuals vary on the level of their need for uniqueness as a trait, it is important to note that need for uniqueness also can be a state that can be encouraged by others or by situational cues (Markus & Kunda, 1986). Thus, in this chapter we also offer carefully crafted recommendations for leaders about how they can activate that need for uniqueness and satisfy it in ways that have not yet been recommended in previous leadership research.

LEADING FOR UNIQUENESS TO REALIZE CREATIVITY

Leadership in organizations is typically oriented toward mobilizing individuals toward the pursuit of collective goals (e.g., Carter, DeChurch, & Braun, 2015). Activities incorporated under the leadership umbrella include developing a vision and motivating or inspiring individuals to achieve that vision. Some styles of leadership acknowledge that followers have different needs that leaders can recognize or help develop. For example, transformational leadership incorporates the notion of individualized consideration, which recommends that leaders should recognize each follower as an individual (e.g., considering their development plans) different from other followers. Simultaneously, however, transformational leadership also places importance on being part of the collective and subsuming one's interests to that of the group or organization (Avolio & Bass, 2004). Leader–member exchange emphasizes the dyadic relationship between the leader and the follower and includes how leaders develop high-quality relationships through demonstrating understanding with followers, as well as a willingness to help (Scandura & Graen, 1984). Empowering leadership yields a degree of decision-making control over to followers, but it relies on leaders increasing followers' understanding of organizational goals and serving as role models for behavior (which is not as applicable for uniqueness as discussed further in the next paragraph). Finally, individualized leadership theory purports that every single relationship between a leader and a follower is unique and truly dyadic in that its uniqueness is seen similarly between both parties (Yammarino & Dansereau, 2002). Thus, while each of these leadership styles includes some recognition that followers may have qualities of uniqueness, the emphasis on treating followers as individuals versus uniqueness is not fully developed and orienting followers toward assimilating their efforts into existing group or organizational approaches is the final goal. To date, little consideration has been given to leaders influencing uniqueness in followers in order to further develop creativity, a concept we strive to introduce in this chapter.

Leaders often have advanced to their positions as a result of status quo behaviors and therefore are not particularly creative themselves. Even leaders who claim to endorse creativity as a primary organizational goal may reject creative ideas for a variety of reasons. Consider the difficulty of a leader who has been rewarded and even promoted for creating and/ or following "the way things are done here"; for those leaders, follower creativity then represents a clear deviation from organizational norms and the very platform on which organizational leadership has been built. Additionally, creativity and implementing creative ideas inherently involves risk (Mueller, Melwani, & Goncalo, 2012).

The previously given reasons are not the only ones leaders may balk at truly accepting or implementing creative ideas in their organizations. In addition to breaking the mold that has rewarded the leader or that the leader himself/herself perhaps even created, leaders who want to promote creativity and uniqueness for creativity will need to readily acknowledge that followers possess skills and abilities that the leader himself or herself does not hold. Leader humility, therefore, would likely be a quality that would assist with nurturing employees' need for uniqueness. In addition, leaders would need to hold a deeper form of respect for creativity than simple claims that creativity can be beneficial. Marketplace demands for immediate financial returns often work against the deep form of respect for creativity that can facilitate long-term benefits.

A key challenge for leaders who wish to encourage followers' need for uniqueness is how to do so while simultaneously addressing organizational realities that underscore themes that are the antithesis of uniqueness: conforming to organizational policies, meeting predetermined objectives, and aligning efforts with organizational goals. Since helping high-uniqueness individuals reach their creative potential in part depends on creating conditions in which being different is encouraged (Whitney, Sagrestano, & Maslach, 1994), leaders can create organizational or group cultures in which being different is not only supported but also fostered and expected. For instance, leaders could communicate expectations for uniqueness and celebrate examples when being different benefited the organization. Furthermore, although an important role that leaders play in the creative process is to evaluate ideas and provide feedback, delaying evaluation and feedback would be beneficial in order to minimize the constraining effect that such behaviors may create and allow uniqueness to be manifested in creative output (Mainemelis, Kark, & Epitropaki, 2015; Mainemelis & Ronson, 2006).

Leading for creativity through uniqueness is suggestive of a different leadership approach than what currently is suggested in the literature. One such current suggestion is grounded in social identification theory, and recommends that leaders stimulate creativity by appealing to followers' needs for social identification. For instance, based on their findings, Hirst, Van Dick, and Van Knippenberg (2009) argue that individuals

invest in creative effort in order to help the group that is an important part of their self-concept. The practical implication of this approach is that individuals are encouraged to identify with group goals such that group goals and their own goals are one and the same. By contrast, an approach that encourages uniqueness would instead concentrate on how individuals could set themselves apart from others through their creativity. In doing so, the emphasis is more on reinforcing one's personal identity (which is composed of an individual's unique background and experience) (Brewer, 1991; Brickson, 2000). Although personal identity is distinct from social identity (which is group-based) and can focus on one's self-interest, it can support group or organizational goals; a challenge for leaders attempting to lead for creativity through uniqueness is to highlight the importance of an employee's personal identity without creating antagonism between the individual's goals and the group or organization's goals. Emphasizing one's uniqueness in a way that aligns that uniqueness with the strategic necessity for creativity will help leaders activate that personal identity without compromising the focus of needing to accomplish organizational goals. In addition, since the frame of reference for personal identity tends to be interpersonal comparisons (Brickson, 2000), leaders would be well advised to direct those comparisons to individuals outside the company (perhaps in the industry at large) so that intragroup competition does not derail the achievement of group or organizational goals.

Individuals vary in the strength of their need for uniqueness (Snyder & Fromkin, 1980). Even for individuals with a strong need for uniqueness, there are other personal identities that compete for attention. Therefore, an area of influence for leaders interested in encouraging creativity is to increase the salience of a follower's personal identity related to uniqueness. As proposed by several role theorists (McCall & Simmons, 1978; Stryker, 1980), a hierarchy of salience is constructed for each individual such that role identities are positioned at higher levels in the hierarchy when those identities are drawn upon in fulfilling role requirements. Thus, as individuals experience more situations in which they fulfill particular roles, they build greater commitment to the identities involved in those roles and those role identities become more important to them as individuals. McCall and Simmons (1978) also posit that role identities gain higher levels of salience as a function of (1) the mutual influence of the individual and his or her audience and (2) the rewards associated with a particular role identity. The implications of these conclusions for leaders are that it would be helpful not only to emphasize the importance of uniqueness as part of followers' role requirements but also to increase the frequency with which followers engage in roles that involve uniqueness relative to roles in which uniqueness is less necessary. This point is important and gets at the earlier assertion that leaders make operationalizing one's uniqueness an expectation that must be met in order for creativity to occur and for the company to be optimally competitive. It is

a very different approach for leadership to say "we expect you to show us your uniqueness daily" than to simply say "we value diversity."

When leaders wish to encourage creativity by considering followers' need for uniqueness, they may need to adapt techniques that have been proposed to help facilitate creativity, such as role modeling, participating, and goal setting (Mumford, Scott, Gaddis, & Strange, 2002). Instead of relying on role modeling as a leadership tool, encouraging creativity through uniqueness entails allowing individuals to differentiate themselves from others. Alternatively, while role modeling their own uniqueness, leaders can repeatedly articulate and reinforce that they do not want followers to be like them in the exact way they operate and act at work, but rather want them to match their demonstration of uniqueness and demonstrate how they too are different. Leaders thus might engage in discussions with followers about what could be done differently or what is missing from the team, the unit, or the organization overall and how their followers could fill those gaps with parts of themselves they are not necessarily bringing to the workplace. It could be possible for followers to learn from other employees who have demonstrated uniqueness, but leaders would need to highlight how it was being different that was the key behavior. If that is not highlighted, the danger exists that employees will simply replicate the highlighted employees' behaviors.

In a similar vein, established group decision-making techniques can be very helpful in terms of stimulating and protecting an individual's need for uniqueness and the great ideas that can come from one's activation of their uniqueness. Considering individuals' need for uniqueness might involve ways of capturing involvement that allow for uniqueness to be maximized. For example, the nominal group decision-making technique (Delbecq & Van de Ven, 1971), whereby individuals come up with their own ideas before discussing ideas with other group members (when conformity tendencies that counter uniqueness could take hold), is a valuable process for those leading groups and teams with creativity goals. Leaders providing special instructions to make their ideas as unique as possible will help activate members' need for uniqueness and increase the probability of more unique, creative output from team members. Finally, individual and organizational performance management and goal setting also will likely need to be altered and reconceptualized in order to incentivize and reward individuals' uniqueness, which differs from simply doing more work or better-quality work on predetermined dimensions.

ACTIVATING FOLLOWER NEED FOR UNIQUENESS

Interestingly, there are theoretical perspectives that indicate an interrelationship between uniqueness and similarity, which at first glance may seem to depart from what has been discussed earlier. Optimal distinctiveness

theory suggests that individuals like to feel a sense of belonging (which could stem from similarity) at the same time that they are motivated to feel different (uniqueness). Additionally, Snyder and Fromkin's (1980) theorizing suggests that individuals who feel a high degree of similarity to one or more people become motivated to demonstrate uniqueness. Taken together, these two perspectives suggest that leaders could increase an individual's need for uniqueness, but leaders also may need to create the sense of a fairly substantial degree of similarity relative to others in order to motivate behaviors that are oriented toward uniqueness. In other words, leaders may stimulate uniqueness by highlighting the similarity that a follower has to someone else. This is because a moderate level of similarity toward others could just indicate belonging without triggering an imbalance regarding uniqueness that requires fixing. Indeed, the complexity of individuals needing belonging to activate uniqueness is difficult to wrap one's mind around, let alone lead a group or organization in a way that accomplishes both. Theory has a rich opportunity to continue to develop and test the balance between the two as it relates to stimulating creativity.

Because the need for uniqueness can operate as a state (in addition to being considered a trait), leaders have the potential to influence followers' need for uniqueness as a state with implications for creativity. One way to stimulate uniqueness as a state within followers is to engage in behavior that might not come to mind immediately for most leaders: increasing followers' feelings of entitlement as a state. Zitek and Vincent (2015) found that individuals who feel temporarily entitled (defined as believing that they deserve special treatment, that their needs are especially important, and that rules do not apply to them) are more creative and this effect was mediated by a need for uniqueness. In other words, entitled individuals engage in creative behavior as a result of their desire to be unique. There may be a self-efficacy effect that also underlies this effect, but it also appears to be the sense of being special and important that drives an increased need for uniqueness that results in creativity. Interestingly, these findings applied only to state entitlement; trait entitlement was not positively related to creativity, which was explained as being likely due to a lack of motivation or effort in those with a chronic sense of entitlement (Zitek & Vincent, 2015). Leaders should also be aware that narcissists (who similarly possess a sense of entitlement) believe themselves to be more creative than others and often are skilled at convincing others that they are creative despite evidence that they are objectively no more creative than nonnarcissists (Goncalo, Flynn, & Kim, 2010). This suggests that leaders' temporary elicitation of state entitlement would best be applied to individuals low in narcissism.

While leveraging the interplay of uniqueness and entitlement represents fascinating ways for leaders to increase creativity in followers, there are a number of other ways that leaders could stimulate a state of a greater

need for uniqueness. Some could be quite simple; for example, just reminding followers of great work they did that was unique will reinforce the state and the role expectations for uniqueness. Another opportunity for activating uniqueness as a state could also be special "calls" for creative output that is especially unique. Even highlighting posters or employees' uniqueness in a style of the popular Facebook series "Humans of New York" would show the individuality of employees, their gifts, backgrounds, and dreams, and would demonstrate that the organization values their uniqueness. Having special creative challenges and celebrating the uniqueness of the different submissions also represent opportunities in which uniqueness could be demonstrated.

UNIQUENESS AND FORMS OF CREATIVITY

Leading for creativity through uniqueness can take on different forms in part due to the form of creativity that is desired. Earlier we discussed how leaders could create opportunities to make creativity and uniqueness an expectation and part of an individual's role. Unsworth (2001) developed a 2 × 2 framework that depicts the problem type (to what extent the problem already has been delineated before creativity has begun) varying with whether the demands for creativity are internal versus external. The four forms of creativity included in Unsworth's framework are as follows: expected creativity (a required solution to a discovered problem), proactive creativity (a volunteered solution to a discovered problem), responsive creativity (a required solution to a specified problem), and contributory creativity (a volunteered solution to a specified problem). Considering how leaders could assign different problem types to different individuals as development opportunities helps scholars and practitioners alike generate new perspectives on how leaders might stimulate uniqueness and creativity in followers. Individuals may have preferences for particular problem types in part based on the manifestation of their uniqueness, as well as on their preferences for incremental versus radical forms of creativity (Gilson & Madjar, 2011; Kirton, 1977).

High-uniqueness individuals could find ways to express their uniqueness in any of the four creativity forms depicted in this framework. However, one might expect that the opportunities for displaying uniqueness would be highest for proactive creativity (open problems with internal demands for creativity) since the individual could feel unique not only in identifying that a problem exists but also in bringing creativity to a situation in which creativity was not expected by others. Applying similar logic, individuals who are oriented toward uniqueness might be least enthusiastic about responsive creativity relative to the other forms of creativity since this creativity form involves a problem that already has been delineated

and creativity is expected. Thus, unique ideas could be advanced, but the opportunities to seem different would be within a narrower bandwidth than would be possible with the other forms of creativity. The other two forms of creativity (expected and contributory) would be fairly comparable with one dimension of the framework lending itself to more (and the other dimension to fewer) uniqueness possibilities. An implication for leaders includes that sending the message that proactive creativity is welcome could be beneficial. Since proactive creativity is not always needed, leaders can think about how a portfolio of opportunities for creativity might be offered such that a variety of creativity forms can be encouraged. Not all high-uniqueness individuals may prefer the same forms of creativity so recognizing where preferences may lie also could be beneficial.

LEADERSHIP, UNIQUENESS, AND NATIONAL CULTURE

Given that uniqueness can be reflected in numerous ways, including through difference (e.g., abilities or personality), separateness (distance from others), or social position (distinctiveness in one's place within social relationships, including kinship ties, friendships, roles, and social status) (Vignoles, 2009, p. 495), there is an opportunity to consider the interplay between uniqueness and numerous aspects of national culture. Leading for creativity through uniqueness should not be dismissed as strictly an individualistic cultural phenomenon. Studies that have examined national cultural variation in need for uniqueness have not found consistent effects (e.g., Burns & Brady, 1992; Tafarodi, Marshall, & Katsura, 2004). National culture, however, represents rich traditions, norms, and unique experiences, all of which give individuals fodder to leverage once they activate their uniqueness for creativity. In collectivistic cultures, uniqueness through social position or uniqueness through being different from other social groups would be expected to a larger extent while uniqueness through difference or separateness relative to other individuals would be expected with greater frequency in individualistic cultures even though all forms of uniqueness could be found in all cultures (Vignoles, 2009). This suggests that leading high-uniqueness individuals for creativity should involve different emphases depending on the culture. In collectivistic cultures, leaders could encourage creativity through uniqueness by highlighting that new and useful ideas will help the company to succeed or will assist the work group in looking good. An employee who achieves creativity through uniqueness can be seen as adhering to social norms and roles in ways that are exemplary. Thus, a rich future for research agendas related to the influence of national culture on one's need for uniqueness exists.

Moreover, research regarding how leader can activate cross-cultural differences among employees and build their unique traditions, backgrounds, and experiences into those role expectations discussed earlier will also offer rich opportunities for scholars and practitioners to consider in future research.

MEASURING NEED FOR UNIQUENESS

For researchers interested in exploring need for uniqueness as it relates to leadership and creativity, there are several options worth considering for measuring need for uniqueness. The instrument that is most well known is Snyder and Fromkin's (1977) Need for Uniqueness scale. As noted by Vignoles (2009), Snyder and Fromkin's scale has been criticized for emphasizing public and socially risky manifestations of uniqueness. Research more recently often has relied on a shorter Self-Attributed Need for Uniqueness scale developed by Lynn and Harris (1997a), which has been used to assess consumer preferences for uniqueness. Because a large proportion of research on need for uniqueness investigates consumers' interest in products and services that differentiate themselves from other consumers, there also is a version of Lynn and Harris' (1997b) scale that assesses an individual's desire for unique consumer products.

As noted earlier, need for uniqueness has been found to be positively related to creativity (Dollinger, 2003; Kim et al., 2013). Need for uniqueness also has been found to be associated with several personality attributes as well as to group member influence. Specifically, Snyder and Fromkin's measure of Need for Uniqueness was found to be positively related to extraversion and negatively related to openness to experience (Swami et al., 2013). In a group setting, need for uniqueness has been found to lessen the influence of those in the majority within the group, but does not appear to increase the influence of those with perspectives that are in the minority (Imhoff & Irb, 2009; Rios & Chen, 2014).

FUTURE RESEARCH

Our hope is that this chapter has stimulated ideas for future research to consider how leaders can stimulate and activate employees' need for uniqueness, and thus create a workplace environment where individuals' uniqueness is expected, stimulated, and rewarded. A number of rich research opportunities exist to explore how leaders can employ leadership tactics from both traditional research and others mentioned herein, and

measure the relative "optimal" mix that results in the most creativity possible in terms of both processes and outcomes.

Theoretically, there exist a number of seemingly contradictory results and recommendations about how leaders should build groups that have shared mental models about strategy, culture, and norms while, at the same time, leaders should celebrate individuality and uniqueness. A plethora of opportunities exists for exploring the relationship between need for uniqueness as a trait and a state, and how leaders can select for the optimal levels, activate the state, and then design organizations that allow the uniqueness to be expected, monitored, fostered, and rewarded. Further work is necessary to more fully develop and test the empirical relationships that exist between uniqueness and creativity at work, and how that relationship differs from more traditional leadership approaches to individually recognizing followers and creativity. For certain, more theorizing is necessary to help leaders differentiate between the two concepts and the related recommendations, as well as the theoretical mechanisms that each approach activates and how those affect creativity at work. Finally, future research also has unlimited opportunities to explore the relationships among the self and others, particularly as the knowledge base in creativity research is learning more about the social processes that help facilitate creativity at work. We have a lot of work to do to address the questions mentioned earlier, which makes this an exciting time for conducting research in the area of leading creativity and the need for uniqueness.

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Mind Wandering, Creative Writing, and the Self

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INTRODUCTION

Most creativity research has relied on individual differences or laboratory studies employing tests involving divergent thinking (Torrance, 1972) or experimental tasks involving insight (Finke, Ward, & Smith, 1992). Many of these studies approach creativity as a problem-solving activity. This approach has a double allure: on the one hand, it is easy to operationalize in controlled experimental setups or in paper and pencil (or computerized) tests; on the other, it appeals to our capacity to overcome concrete difficulties in novel and unforeseen ways. As such, this approach has provided a fertile ground to produce a wealth of studies dealing with the psychological and neurobiological underpinnings of this phenomenon (Bowden, Jung-Beeman, Fleck, & Kounios, 2005; Hélie & Sun, 2010; Kaufman & Sternberg, 2010; Kounios et al., 2006, 2008; Schooler, Ohlsson, & Brooks, 1993).

Just for the sake of the argument, we will call this approach here the problem-solving model of creativity. It is worth noting that the problem-solving model of creativity is in line with a certain view on the brain's role in behavior and cognition, a view that held sway for most of the second half of the 20th century. Under this perspective, the brain is fundamentally a (very sophisticated) reactive machine that guides behavior by producing appropriate responses to stimuli that arise in the environment. Knowing, perceiving, or creating something is therefore seen as a consequence of some external challenge or situation, usually one that can be pinpointed in time and space. This approach naturally highlights those aspects of cognition that are related to events that trigger specific actions. Accordingly, it fits well with creativity as a matter of producing a novel solution to a well-defined problem.

At the same time, this approach neglects spontaneous, nonstimulus-related aspects of cognition that are characteristic of waking life: active self-motivated exploration of the environment and the ongoing flow of stimulus-unrelated thoughts we experience every day. The view of the brain as dynamic and the mind as inherently restless goes back at least to James (1890), Lashley (1930), and Singer (1966, 1975), among others (Freeman, 1975; Llinás, 1988). Yet, only with the seminal work on the default mode of brain function (Gusnard, Raichle, & Raichle, 2001; Raichle et al., 2001) the endogenous dynamics of the brain started to be taken into account more widely. With this shift, those aspects of mental life that happen when not engaged in specific tasks were brought to the fore and became the target of concerted empirical enquiry (Mason et al., 2007; McKiernan, D'Angelo, Kaufman, & Binder, 2006; Smallwood & Schooler, 2006).

Probably the phenomenon of mind wandering is the one that has attracted the most attention among those reflecting spontaneous cognition (McMillan, Kaufman, & Singer, 2013). During mind wandering one experiences an ongoing, mostly spontaneous flow of thoughts that do not necessarily pertain to the current environmental context (as when you let your thoughts drift while attending a lecture or walking down a park). In the problem-solving, task-oriented reactive brain scenario, mind wandering is naturally seen as a hindrance. Indeed, numerous studies have shown that spontaneous distractions can impact performance negatively in a wide variety of tasks, such as learning from a lecture (Lindquist & McLean, 2011; Risko, Anderson, Sarwal, Engelhardt, & Kingstone, 2012; Szpunar, Moulton, & Schacter, 2013), answering standardized academic achievement tests (Mrazek et al., 2012), and reading (Smallwood, McSpadden, & Schooler, 2008), among others (Immordino-Yang, Christodoulou, & Singh, 2012; Smallwood, Fishman, & Schooler, 2007). In the new scenario, however, this pervasive process has become worthy of study in and by itself (Smallwood & Schooler, 2015). More important, a growing number of studies have started to highlight the potentially constructive sides of mind wandering in creative thinking (Baird et al., 2012; Preiss, Cosmelli, Grau, & Ortiz, 2016; Sio & Ormenod, 2009; Smallwood & Andrews-Hanna, 2013) and self-regulation (Andrews-Hanna et al., 2013; Baird, Smallwood, & Schooler, 2011; Zedelius & Schooler, 2015). The shift toward the endogenous dynamics of brain activity and the spontaneity of the mind highlights a different yet necessary perspective on creativity. This shift allows us to go beyond the dichotomy between task-oriented problem solving and task-unrelated spontaneous mind wandering.

We have previously argued that a psychological understanding of creative insight has to take into consideration the complex temporal structure of the ongoing flow of experience (Cosmelli & Preiss, 2014). According to our view, creative insight reveals a dual temporal orientation. On the one hand, insight has an immediate reference to what was going on in the

preceding moment, as the experience of solving a problem by insight is always related to a prior "wanting" or "lacking" context to which that insight responds. Accordingly, insight solutions are commonly experienced as *gap filling* (Gruber, 1995). On the other hand, insight solutions are creative not only because they solve a given problem unexpectedly and originally but also since they involve a restructuring in the perception or representation of the problem itself (Chi, 1997; Weisberg, 1995). As such, creative insight changes the manner the current problem is interpreted vis-à-vis its future consequences. In contrast to the past-oriented dimension of insight, this future-oriented aspect is most clearly illustrated through biographical accounts of spontaneous insight and interviews with individuals that discover new ways of looking at an old problem or produce a theoretical synthesis of previously unrelated phenomena (Csikszentmihalyi, 1996; Csikszentmihalyi & Sawyer, 1995; Gruber, 1995; Gruber & Wallace, 1999).

Consequently, if we take into consideration the mind's spontaneous thoughts as the background of the creative processes, it becomes evident that these processes are profoundly self-affecting and therefore deeply intertwined with the creator's process of identity development. Indeed, recent work on the modes of thought underlying the creative process have shown that the two main processes involved in creativity—idea generation and idea evaluation—depend on a delicate interplay of multiple brain networks (Ellamil, Dobson, Beeman, & Christoff, 2012; but see also Jung, Mead, Carrasco, & Flores, 2013; Mok, 2014 for convergent ideas). On one hand, generative ideation is correlated with medial temporal lobe activity. On the other hand, idea evaluation processes recruit both executive regions and default mode regions, including relevant nodes of limbic regions, such as the anterior insula, putatively related to internal visceroceptive processes (Ellamil et al., 2012; Fox & Christoff, 2014; Singer, Critchley, & Preuschoff, 2009).

The main contribution of this extended temporal approach to insight is that it makes possible to relate the creative process to self and identity development. What we argue here is that professional creators develop a sense of identity that is strongly grounded on their awareness of the mind wandering process. As authors become more expert, they gain a better understanding of the creative process and apprehend its phenomenological nature. Specifically, they become *mindful mind wanderers*. That is, they make temporally extended insight problem solving a core part of their self and their life story. To understand how this process works it is useful here to capitalize on the life story model of identity (McAdams, 2001). As noted by McAdams, *modern* personal identity takes the form of a story including all of its components, that is, setting, scenes, character, plot, and theme. A personal life story crystallizes in late adolescence and young adulthood and, during adult life, it becomes an evolving self-story where the narratives people make about themselves provide them with a sense

of unity and purpose. A similar view to that of McAdams is that espoused by Nelson and Fivush (2004), although with a focus on memory instead of on identity. For Nelson, the development of autobiographical memory has a strong narrative component. Autobiographical memory develops from episodic memory by means of the internalization of a narrative structure. The developing child internalizes that structure by means of dialogue with his or her mother or adult caregiver. And consequently it makes possible the development of a self (in the McAdams sense of self, i.e., as a life story). It is worth noting that narrative provides individuals with a platform to connect their life stories with their lives within a cultural community. As Bruner (2002) notices, "it is the conventionalization of narrative that converts individual experience into collective coin which can be circulated, as it were, on a base wider than a merely interpersonal one" (p. 16). Paraphrasing Bruner, we propose that, as writers shape their personal identity, the conventionalization of narrative helps them to convert their individual experience of mind wandering into a meaning-making activity that contributes to cultural creation significantly. Specifically, creators make the creative process part of their life story by means of four processes:

1. acknowledging extended time;
2. developing trust in incubation;
3. incorporating the creative process as a part of identity development;
4. recognizing the positive impact of creativity on overall well-being.

In doing so they generate a complex interplay between internally and externally oriented processes at the service of creative production. Here, through the interviews of four Chilean poets we will illustrate how the creative process not only is embedded and situated in a flow of experience but also embodies a fundamental part of the constitution of the identity of the creative writer.

INTERVIEWS

One of the authors of this chapter interviewed four poets. These interviews were long biographical interviews whose goal was to collect biographical information about the lives of Chilean writers during the last quarter of the 20th century. In addition to biographical information, the authors were asked about the ways they created their poems, their writing routines, and ways they addressed writer's block. Excerpts of those interviews are summarized next. We selected and organized these excerpts based on our interest in the relationship between mind wandering and the self. First, we will present short biographies of these poets. Next, we will organize their views on creative writing in the four aforementioned processes.

The Authors

The poets are Sergio Mansilla, Rosabetty Muñoz, Clemente Riedemann, and Veronica Zondek.

Sergio Mansilla was born in Achao, Chiloé, in 1958. He grew up in the Island of Quinchao. He studied to become a teacher of Spanish and Philosophy at the *Universidad Austral de Chile*. During the 1980s, he worked as a teacher in different localities in Southern Chile. In 1996, he obtained a PhD in Romance Languages and Literature at the University of Washington, Seattle. After coming back to his home country, he became a faculty member at the *Universidad de Los Lagos*. He is a corresponding member of the *Academia Chilena de la Lengua*. As an academic and a poet, he has published about 10 books of poetry and literary criticism. In 2009, his book *Retratos y autorretratos deformes* awarded him the *Premio Consejo Nacional del Libro y la Lectura*, one of the most important literary awards in Chile. Currently he is a professor at the *Universidad Austral de Chile*.

Rosabetty Muñoz was born in Ancud, Chiloé, in 1960. She studied to become a teacher at the *Universidad Austral de Chile*, where she wrote her first two books of poetry. As a Spanish language teacher, she has worked in several schools of the island of Chiloé. She published her first book of poetry in 1981. Since then, she has kept publishing new collections of poetry and her poetry has been collected in several anthologies of Chilean and Latin American poetry. She has received 11 awards of poetry including the *Premio Pablo Neruda*, the *Premio Consejo Nacional del Libro y la Lectura*, and the *Premio Altazor*, all of them significant acknowledgments to her literary talent.

Clemente Riedemann was born in Valdivia in 1953. His studies of Spanish and Philosophy at the *Universidad Austral de Chile* were interrupted by the coup d'etat of Augusto Pinochet. He was active in politics and detained by the dictatorship's police. After about 1 year of political detention, he came back to the university and completed a degree in Anthropology. Later, he was certified as a teacher of history and geography at the *University de La Frontera*. He has been awarded the *Premio Pablo Neruda*, the *Premio Casa de las Americas*, and the *Premio Municipal de Literatura*. His poems have been published in a large number of anthologies both nationally and internationally. In addition to poetry, he has written theater and essay works, as well as collaborated with the well-known popular song duo Schwenke and Nilo.

Veronica Zondek was born in 1953 and currently lives in the city of Valdivia. In addition to her work as a poet, she is also a translator. She obtained an undergraduate degree in Art History at the Hebrew University of Jerusalem. She has received three times a writing fellowship from the *Consejo Nacional del Libro y la Lectura* and several other grants as writer and translator. She has collaborated with artists and photographers.

IV. SPECIFIC CONSIDERATIONS

Her first book was published in 1985 and since then has published poetry books in Chile, Argentina, Colombia, Spain, and Canada. She is a creative polymath. She has translated into Spanish the works of Derek Walcott, June Jordan, Gottfried Benn, Anne Sexton, and Anne Carson. She has investigated the letters and works of Gabriela Mistral. She has collaborated with musicians, cinematographers, and visual artists.

ACKNOWLEDGING EXTENDED TIME

One of the primary ways writers become full-time creators is by acknowledging that creative writing takes an extended amount of time. Indeed, one of the main markers of expert creative writing is recognition that creative writing involves time both on task and off task. Writing is not a highly localized activity. It is an all-encompassing one. Professional writers are experts in engaging the creative process not only when they are producing text but also when they are doing tasks that are completely unrelated to their creative work. Clemente Riedemann uses an interesting cooking metaphor to refer to the role of time in writing:

> During the preparation of food, my mother—and all the stay at home women of their generation—let the food "waiting" before it was consumed. Even the beverages, then prepared at home, had a lapse where they were not supposed to be touched or watched. She said that nature had to intervene in some manner so the preparation was completed. After a while, she checked the food and "felt" whether it was ready or not. I have used the same procedure when I am in the process of creating a new work. I understand that there does not exist a finished or perfect work of art, as the dynamic of time ends by modifying its appreciation in one way or another.

DEVELOPING TRUST IN INCUBATION

It is not enough to recognize the role time plays in the creative process in order to make mind wandering part of the person's self. It is also necessary to see incubation in a positive light. By underscoring its benefits, authors develop a sense of the positive consequences of mind wandering and how it can be used strategically. There are many aspects of incubation that are instrumental to the creative process. Acknowledgment of the role incubation plays in creativity is part of the process of building a self continuously engaged with the creative process. Some authors underscore the apparently random nature of incubation and how it transforms the writing process from one focused on translating text (or content) to one focused on exploring the creative process itself. Based on his Anthropology studies, Clemente Riedemann indicated the following:

I work in my books as research projects, adapting models that I assimilated in my anthropology studies. The origin may be in a vision, an intuition or a reflection and, then, after an exploratory phase where progressively the possible destiny of this experience is clarified, I start the writing process, which in turn opens new expansive options to the full set. I understand that this related to Ilya Prigonine's idea of *dissipative structures*, especially as it refers to nonlinearity, fluctuations, bifurcations, and self-organization—concepts that help me to explain the creative process, as it is evidenced on my own experience as a writer.

Another way to link mind wandering and self-development is by making sense of the silent moments of the creative process. Indeed, lack of text production does not imply that the artist is not *writing*. By acknowledging incubation, professional writers not only make sense of those silent moments but also are able to put those silent moments at the service of their creative endeavors. As noted by Veronica Zondek:

> If I don't write, I review what I have written; if I don't review, I am reading something that is close to it; I relate to what I am doing but not necessarily through writing. Some days I devote hours to my books, others just ten minutes, and others I take notes while I am doing other things at home. I have learnt to work in slices of time and not being anxious about it. At the beginning I was very anxious, it was horrible, it was very stressful, I had to stop so I could do something absolutely trivial. I had to learn that trivial stuff is very relevant. On the other hand, I have learnt to use those lapses of time such as when I am in the subway, the night, moments between work, between gardening or putting things in the oven.

Some writers allow the mind wandering process to produce meaningful units, which are explored only when certain corpus has been reached. Thus, they alternate between periods of free writing and periods of controlled writing, which mirror the distinction between a generative and an exploratory phase in creativity (Finke et al., 1992). Rosabetty Muñoz indicates the following:

> Let us see, I have always worked in the same manner. In fact, I haven't varied anything after all the years I have been writing … I am always attentive, in a permanent state of observation or perception of the reality of voices, of what I hear, images that suddenly come to me, and elements of the reality that strike as notorious or that can suggest something. And I take a lot of notes, I am always with a notebook where I write everything, reflections, texts that I read elsewhere … and months pass where that work is meaningless, it is just there, accumulating and accumulating until at some point it takes shape and an appearance of order. My only duty, then is to find the spine of that corpus and search for what is useful for that spine, although this happens, I don't know, each three years, when things become more orderly in such a way that I realize what I have been doing and following in those notes. And I try to recover it, now consciously, sit in front of it, reading a lot, reading other texts that are connected with the topic of interest, from other areas of knowledge, and everything that is available for me to work on those notes that were like larvae. And then I demand a schedule for myself; I ask to be in my desk, hours of silence, put everything in order so nobody bothers me. It is an exceptional time. I never work, like in business hours, but during that period.

Finally, a creative writer can intentionally create the conditions for productive incubation. This include not only creating the necessary material conditions for creative writing but also self-triggering a creative disposition by priming thinking intentionally with creative inputs. As indicated by Sergio Mansilla:

> How do I write? I write while reading, literally. Always a writer reads for obvious reasons, but what I want to say is that when I write on a white page, I need to be reading at the same time, reading poetry at the same time. I have a writing method that is very curious. I used to have two or three open books when I am reading. Not any book, but books that are related to the topic I am ruminating at that moment". More specifically he states, "I do not write based on a central unified theme. I know that some fellow writers set themselves the goal to write about something and assemble a set of poems. I write on the basis of what I am getting out, usually kind of records of daily life in the generic sense of the term. The thematic units come afterwards, when I re-read what I wrote; then I begin to realize that there are connections. My books have always been born after the fact, as I don't have in mind to write a book about such or such. I just write, write and when revisions are made, when I'm going to clean or working or reworking the poems, I find the connections that allow me to connect a poem to another, put it in the same section of what may be a future book. Sometimes there are poems belonging to the same section but written in different years.

INCORPORATING THE CREATIVE PROCESS AS A PART OF IDENTITY DEVELOPMENT

Creative writers not only develop strategies to capitalize on mind wandering in a significant, or task-related, way but also integrate the phenomenology of the creative process in their self-understanding. In so doing, they recognize that creative writing is not a localized problem-solving activity but a continuous meaning-making enterprise. Thus, the creative process becomes fully integrated with their personal identities. Clemente Riedeman uses the metaphor of a trip to explain how publishing a poetry book involves presenting readers with incomplete samples of that trip:

> We as human beings are incapable to reach formal perfection, conceived in traditional terms or as something closed and modifiable. But, we can reach some equilibrium in the harmony of the elements, and trigger a significant context that accepts the appearance of novelty added to the entire set. Specifically, we do not publish finished work but samples of an exploratory process and approximations to a specific meaningful context. Thus, editing a book, involves sharing with readers a part of a trip, on the road to find an expression that better suits the full set of an existential experience.

Rosabetty Muñoz, when discussing the differences between her younger and more mature experiences as a writer, describes the process of her maturation as a process of growing awareness and control of spontaneous thought. Thus, she seems to suggest that the development of expertise as

a writer involves converting productive mind wandering into a communicable experience for a general reader:

> Let us see, I think that one loses and one wins in this process. When I was younger, I was more spontaneous, free, because I let my emotions flow, in the sense of letting myself be trespassed by this image, like if one was a simple medium. But, as I did not have many practical and concrete working rudiments, I think that many of those images from an always-marveled perception were lost. As the time has passed by, what I have been doing is trying to squeeze the juice of that image. I may have lost spontaneity but I have won in awareness, that is, in making words to really deliver what I think is in the spirit of my perceptions. What one gains is to make an experience communicable, an experience of perception which otherwise can be too intimate to communicate.

RECOGNIZING THE POSITIVE IMPACT OF CREATIVITY ON OVERALL WELL-BEING

The relationship between creative writing and mental health is a complex one, which goes beyond the scope of this chapter. Still, the authors interviewed provided us with new insights on the matter. Specifically, by focusing on the role that mind wandering plays on the creative process, they suggest that when the writing process finishes, or reaches some form of closure, it triggers a feeling of well being. This process is a consequence of their understanding of mind wandering and incubation as temporally extended processes. Verónica Zondek indicated the following:

> In general, I have obsessions, things that turn in my head, and the books are generated around that obsession. That's why I am telling you that now looks like I am with a lot of obsessions because I am writing several books at the same time. But, in general, that was something that was bothering me in my head, and a manner to put that constant buzz to rest is to put it on paper. And then a book is built around that, which involves two phases: the first is one where the process involves a sort of throwing up or taking out that which has been boiling inside; the other is where I work, which is the part that really captures my interest, relaxes me and that I really like. Because the first part is not enjoyable; on the contrary, it is very lonely, painful and it does not give much pleasure … First, I feel anxious; while I don't get it out of me, it keeps turning on me obsessively. It does not allow me to go ahead with my everyday life, sleeping, cooking, going out, seeing a movie. I see everything through it! Everything is read and interpreted from the standpoint of that obsession; it is ridiculous, it deforms everything. In that sense it is exhausting, and in some moments, unbearable. There is a moment where I have to take it out if not I can become crazy.

Clemente Riedemann described a similar idea when he uses the metaphor of a burglar to describe the feeling of being assaulted by imagination:

> We are doing an ordinary life, we are attending domestic affairs and suddenly imagination assault us—like a burglar appearing when we turn a corner—and steals our attention, forcing us to think about it, to decipher an enigma, which can be an obsession of the present, a desire, or a memory. I prefer to think that this always implies

an impulse towards the expansion of the imaginary or towards a diversification of our interpretations about a specific affair. I like to think that my words are signals indicating a road towards existential well-being, not because the content of the topics, but because of the way I refer to them, because of the different expressive modalities of my language.

CONCLUSION

The main argument we have proposed here is as follows. Creative writers not only capitalize on productive mind wandering for idea generation but also make sense of the role mind wandering plays in writing by making it part of a more general creative self. One of the privileged manners they do so is by becoming *mindful mind wanderers*. This involves four processes. The first of these processes includes acknowledging that writing is a process happening in extended time. Writers experience writing as a full-time activity involving both time on task and off task. By understanding that writing is a long-term process, creative writers get more acquainted with the psychological nature of the creative process. Specifically, they learn how to trust the unconscious process underlying creative incubation. For instance, they may let the writing process flow up to the point where they have a significant corpus of material to revise. Then, and only then, they use controlled strategies to review their writing. As a result, creative writers start to see that the creative process not only involves full involvement and repeated practice with a specific task but also develops a full set of activities around itself, although these activities are not specifically related to text production. These activities give writers a sense of unity and purpose, that is, a personal identity that is built around the phenomenology of the creative process, including its spontaneous dimension. Thus, this identity includes an understanding of the silent times when one is not writing. Additionally, this identity provides them with a larger understanding of the emotional dimension of writing, which helps them to recognize the positive impact of creativity on overall well-being.

Certainly this description is of provisional nature. We have advanced this phenomenological approach to creative writing based on just four interviews. Future research may include consideration of other writers' interviews and biographical material. Although this descriptive approach to the writing process does not rest on conventional quantitative data, we believe it provides with possible avenues of exploration to research the writing process in a manner that gives more consideration to the ecological nature of writing. In doing so, we can understand that writing is not only a problem-solving activity (as championed by most of the cognitive models of writing) but also an activity that requires a full engagement of the writers' emotions and self, particularly when they are trying to take this activity to its highest creative level.

Acknowledgments

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PART V

New Models and Perspectives

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The Dynamic Force Before Intrinsic Motivation: Exploring Creative Needs

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> In order to create there must be a dynamic force. ***Igor Stravinsky (quoted in Barron, Montouri, & Barron, 1997, p. 201)***

Creativity research has delved deeply into its relationship with motivation. Typically, an intrinsic/extrinsic lens is used, following the work of Deci and Ryan (1985, 2000; Ryan & Deci, 2000). Intrinsic motivation is the act of doing an activity for personal reasons, such as enjoyment or meaning. Extrinsic motivation is when someone's reasons are external, such as grades, praise, or money. Many things can trigger extrinsic motivation, including rewards, evaluation, and competition.

Intrinsic motivation is traditionally considered to be optimal for creativity (Amabile, 1996; Amabile, Hennessey, & Grossman, 1986; de Jesus, Rus, Lens, & Imaginario, 2013), although there is also work suggesting that there is a great deal of complexity in this issue. For example, there are several circumstances where rewards can benefit creativity, particularly if the rewards are explicitly connected to creative performance (Byron & Khazanchi, 2012; Eisenberger & Cameron, 1996; Eisenberger & Shanock, 2003). For a more detailed treatment of creativity and motivation, see Kaufman (2016).

Most studies fall into a couple of patterns. Some prime people to focus on either intrinsic or extrinsic motivation (e.g., Amabile, 1996), whereas others examine variables that can trigger extrinsic motivation, such as rewards (e.g., Hennessey, Amabile, & Martinage, 1989). Still others consider motivation as a trait-level variable—in other words, they analyze

whether some people are generally more intrinsically motivated than others (Kaufman, 2002). Occasionally, creativity scholarship moves beyond the intrinsic–extrinsic paradigm and explores other options, such as prosocial motivation (Forgeard & Mecklenburg, 2013), obligation motivation (Cooper & Jayatilaka, 2006), and innovation motivation (Joy, 2012). Yet most work has stuck to intrinsic and extrinsic motivation and its related constructs (e.g., goals and mindsets).

Nearly all of this work, however, begins with a person already having intrinsic motivation for particular activities; the focus is then on how this motivation is linked to increased creative performance in these areas or how this intrinsic interest can be maintained. A different question is the following: what has happened to a person to reach this point? What makes us intrinsically motivated to be creative in some ways, but not in others? Why do we need rewards to get us to perform some tasks but not others?

BEFORE AND BEYOND INTRINSIC MOTIVATION

> No man ever puts down what he intended to say: the original creation, which is taking place all the time, whether one writes or doesn't write, belongs to the primal flux: it has no dimensions, no form, no element. *Henry Miller (quoted in Barron et al., 1997, p. 27)*

Intrinsic motivation is often considered in milder terms—enjoying a challenge, feeling curious, or wanting to increase one's knowledge or skills (e.g., Amabile, Hill, Hennessey, & Tighe, 1994). Yet how do we consider Stravinsky's driving force? What about the passion—the primal flux—that makes someone pursue a quest that may last a lifetime? It is a recurrent theme in biographies and interviews with many noted creators. Miller considered his "primal flux" as the birthplace or cradle of his creative processes. Dancer Anna Halprin describes her creative need as a drive to express herself and connect with others by sharing her performances (Barron et al., 1997, p. 46). Nobel Prize–winning molecular biologist Kary Mullis explained that his desire to pursue experiments is rooted in his curiosity and pursuit of knowledge (Barron et al., 1997, p. 73). These needs are elusive. They are difficult to describe or capture.

There has been relevant work, of course. Schwartz (1992, 1996) presented a set of "value clusters" that underlie motivations for all behaviors. His clusters included power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. Some scholars have linked these values to creativity. Stimulation, self-direction, and universalism have been found to relate to both creative performance

(Kasof, Chen, Himsel, & Greenberger, 2007) and self-reported creative achievement (Dollinger, Burke, & Gump, 2007). The same studies found negative relationships between creativity and tradition, conformity, and security.

Others have looked at interests, which Silvia (2001) describes as being rooted in emotional experiences but then magnified and developed. The most common approach to interests, Holland's (1959, 1997) RIASEC model, is closely associated with vocational choice. His six interests are Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Artistic interests are related to both self-reported creative behaviors (Kelly & Kneipp, 2009) and creative thinking styles (Zhang & Fan, 2007). When academic majors are used as a proxy for interests, artistic interests remain connected with creative performance (Silvia et al., 2008), although other studies have indicated that artistic majors may believe they are more creative but may not necessarily actually be more creative (Furnham, Batey, Booth, Patel, & Lozinskaja, 2011). Investigative interests have also been associated with creativity (Kaufman, Pumaccahua, & Holt, 2013; Perrine & Brodersen, 2005).

Values and interests are certainly one key element of need. We would argue it goes further, however, and includes passion. Vallerand and coworkers (Vallerand et al., 2003; Vallerand & Houlfort, 2003) propose two types of passion, harmonious and obsessive. Although obsessive passion is rooted in uncontrollable urges and may lead to both good and bad outcomes, harmonious passion is a choice and considered to be quite desirable. St-Louis and Vallerand (2015) argue that harmonious passion and positive emotions are a prominent part of the creative process. Similarly, Luh and Lu (2012) note the role of passion in helping those with a creativity-appropriate cognitive style achieve creative success.

We argue that creative needs represent a fusion of values, interests, and passion and can be lifelong creative companions—what Barron et al. (1997) call the desires that remain central features of a creative individual.

There are models of motivation, values, interests, and passion—but what are the core sources of creative need? To develop an initial framework, the first author analyzed 24 interviews with Pro-c/Big-C creators (using the definitions by Kaufman & Beghetto, 2009) that had been conducted by earlier creativity scholars (Barron et al., 1997; Dutton, 2009; Wallace & Gruber, 1989). Six themes were found to recur consistently across the transcripts in the form of significant statements explaining what is experienced and how the individual interviewee experienced the phenomenon (Creswell & Clark, 2007, p. 79).

Six needs (or "dynamic forces") were identified and are proposed here: beauty, power, discovery, communication, individuality, and pleasure. We will detail each of these six creative needs in the subsequent text.

CREATIVE NEEDS: AN INITIAL FRAMEWORK

Beauty

The need to create beauty or aesthetically pleasing product was generally expressed as the desire to create a product that is considered striking either to the self or to others. Although beauty can be difficult to define, it is often conceptualized as the combination of qualities—shape, form, color, and tone—that please the intellectual, emotional, or moral sense. Beauty is neither good nor true, and artists have written eloquently on the elusive and problematic aspects of the term. Joan Miro (Barron et al., 1997) explained when discussing creating something beautiful that "what really counts is to strip the soul naked. Painting or poetry is made as we make love; a total embrace, prudence thrown to the wind, nothing held back" (p. 431). Here Miro is describing the naked soul and her "fundamental surge" to make something beautiful.

Both the appreciation of beauty and the desire to create beauty are powerful motivators for creative pursuits across domains (Dollinger et al., 2007, p. 94). Muth and Carbon (2013) take this a step further and describe creativity for beauty's sake as a matter of engagement with the world. They explain of aesthetics that "Creation and manipulation of sense itself should be rewarding" (p. 25). They then describe that the process of manipulating a medium, the body, or viewing that which is beautiful or aesthetically pleasing satisfies a basic human need to engage with the world and to stimulate pleasure centers of the brain (p. 29).

Power

The need for power, dominance, to be first, or to be ingenious is experienced as the desire to have one's presence or creative work recognized and appreciated by others. This need can include the desire to be better than others or to exert influence over others. The need for power could also manifest in the desire for praise, recognition, or notoriety. Ayn Rand (Gotthelf & Salmieri, 2015, p. 240) asserted, "A creative man is motivated by the desire to achieve, not by the desire to beat others." Yet the distinction can often be slippery. Furthermore, denying the desire to win or to be first ignores the egocentric aspects of the human condition that long for supremacy and influence (Wallace & Gruber, 1989, p. 13).

Dollinger et al. (2007) also discuss power as a value that generates creative behavior across cultures. They described that creating in order to dominate, gain authority over others, to obtain rewards and recognition, or to exert influence is a deeply entrenched part of creative individuals' value systems (p. 93). The CEO who created a space for himself or herself and secured a high-paying position by creatively advertising his or her

skills and abilities, networking, and developing skills in order to fulfill his or her need to lead and exert control would be a prime example of this motivational need.

Discovery

The need for discovery, curiosity, improvement, or progress is defined as the desire to learn new information for the sake of knowing and to produce understanding. This includes the desire to produce work that results in the forwarding of a culture, community, theory, or knowledge base. Cathy Johnson (Barron et al., 1997) describes her creative drive by saying, "I may never make a discovery worthy of the scientific journals; I don't suppose I'd recognize one if I did. I know so little and forget so much; I am often frustrated by the well of my ignorance. But as I line the walls of the shaft with the tangible stones of discovery, at least my well holds water" (p. 88). She describes the intrinsic need to seek knowledge and to discover truth that many creators feel. Even if Johnson never finds a bit of knowledge that progresses the world around her, she still attempts, because it is an integral part of her internal life.

Discovery also allows for the advancement of society, often by virtue of entrepreneurial behavior. Martin and Wilson (2014) highlight several discovery theories proposed by business researchers (e.g., Feit, 2007; Kirzner, 1997; Shane, 2003) wherein curiosity and opportunity lead to discovery and invention. Providing open and free space for thoughtful engagement with material and collaboration facilitate creative discoveries that, for their purposes, generate business (p. 2). Martin and Wilson (2014) go on to state that discovery and invention have "been held to have 'intrinsic linkages' with human creativity" (p. 4). They further argue that discovery is the origin of creativity and even occurs prior to the creative process.

Communication

The need for communication and shared understanding is the desire to understand others and to be understood. This need can include altruistic work and activism. When Anna Halprin (Barron et al., 1997) dances, she says she is creating in the moment: "I want very much to deal with people on that stage who are identifying with the very real experiences in life, in such a way that the audiences can identify themselves in the so-called performers" (p. 34). She verbalizes her need for shared understanding between the creative producers and the consumers of creative products, similar to Glăveanu's (2013) conception of Audience as one of the Five A's. Additionally, Halprin wants to offer her work as a mechanism for other people to come to their own new understandings.

Although communication is related to individuality, we conceptualize it as a separate construct. Communication revolves around the need for shared understanding. Baumeister, Leary, and Steinberg (1995) consider communication to be part of an evolutionary objective to belong to a larger social group. They argue that humankind has evolved to survive best in groups and by sharing experiences, knowledge, and understandings, thus allowing both the individual and the group to progress socially, culturally, and technologically. This need to belong may have started as a survival mechanism but it continues to be a fundamental need. Creative work can be a vehicle for communication such that shared understanding occurs at both the individual and the group level.

Individuality

The need for individuality and uniqueness can also be a powerful driver of creativity. In this framework, individuality is defined as the need for others to understand one's essence, personality, character, and/or belief system. As Dutton (2009) articulated, "any ordinary expressive activity with a creative component—everyday speech, lecturing, home hospitality, laying out the company newsletter—opens the possibility for expressive individuality" (p. 138). Engaging in creative production for the purposes of satisfying the need for individuality is a fundamental aspect of identity creation and understanding of the self. Understanding the self, in this case, allows one to see one's place in the world. Spiller, Peckham, Rattray, and Schmiedeknecht (2007) use architecture as an example of creative self-expression and argue that if architecture firms deny individuality, the resultant products will be mediocre and boring. If the fundamental need to express one's individuality is suppressed, it is easy to imagine the result being a disenfranchised and, ultimately, less creative person.

Pleasure

Pleasure can also drive creative production. We follow Dutton's (2009) consideration of pleasure as an impulse. Creativity inspired by the need for pleasure is designed to produce feelings of happiness and engagement. Much of the core work on intrinsic motivation and creativity underlies the importance of enjoying the process of creativity.

People with the creative need for pleasure may have a strong interest in a particular domain, or they may see their creative outlet as a way of escaping the responsibilities of everyday life (Kelly & Kneipp, 2009). Schwartz's (2012) Theory of Basic Values includes a theme of Hedonism, or the pursuit of "sensuous gratification for oneself" (p. 5). Despite the description, Hedonism is not seen as being purely selfish, just as we do not see the need for pleasure as such. Indeed, altruistic behavior may be

a comparable way for people to get these needs met. Eger (2011) argues that pleasure is a necessity in the learning process and in cognitive and creative growth.

NEXT STEPS

These six needs are certainly not necessarily the ones to be found. Within the transcripts analyzed were also desires for benevolence, stimulation, conformity, tradition, and autonomy. Creators sought ways to express fears, loves, passions, and ways of understanding the world. Such desires and expressive drives were often woven across the six needs already identified. For example, however, this set of desires or motivators was expressed across the six needs identified as variables earlier.

It is important to emphasize that this framework is only the beginning. Both qualitative and quantitative studies are underway to determine how well these six broad needs can account for why people decide to create (and continue to create). What are the dynamic forces that drive us to create in a world that continues to value traditional intellectual abilities and socially appropriate behaviors? If this framework continues to be developed, modified, and studied further, we hope to be able to help people discover their own creative passions.

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Creativity and its Discontents: The Weary Voyager Model of Creativity in Relation to Self

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INTRODUCTION

The process by which a person produces a creative work has been studied by researchers and theorists who have offered multistage models of creativity. One popular model was proposed by Wallas (1926), who thought that creative products come into being through preparation, incubation, illumination, and verification. Recently, Sadler-Smith (2015) suggested that Wallas' original work (1926) shows evidence of an additional stage, intimation, that links incubation and illumination. Other models followed, among which were Mednick's (1962, 1968) remote association model, Rothenberg's (1988, 1991) homospatial and Janusian thinking model, the eight-stage model of Blair and Mumford (2007) and Mumford, Mobley, Uhlman, Reiter-Palmon, and Doares (1991) that starts with problem construction and ends with solution monitoring, and Geneplore model of Finke, Ward, and Smith (1992). These models depict sequences of processes by which a problem is found and solved, and a creative product is generated. In this chapter, we focus on a problem that comes at the beginning of the process and may be as important as the subsequent set of stages. It's the problem of how creative thoughts emerge, and of how such thoughts are related to the structure of the self.

Once a creative thought comes, it can have many fates. It can be forgotten or pursued; it can be elaborated or jumbled. Sometimes, very rarely, it may be the basis of a Nobel prize–winning scientific advance or a much-loved work of art. While the destiny of creative thought is a formidable

and fascinating subject, it is the origin of this thought and its relation to self-structure that we consider here. Our approach frames the presence or absence of creativity in relation to self as occurring close to the beginning of our cognitive processes—at the doors of perception.

PERCEPTION OF PAST AND PRESENT

We live in a world of both stability and change. Among stable elements for most of us are loved ones and perhaps the place where we live. Among changing elements are new acquaintances, new technologies, and new pieces of art and entertainment. In evolutionary terms, it seems that the line that led to modern humans divided from the line that led to modern chimpanzees approximately 4 million years ago (Gribbin & Cherfas, 2001). The best index we have of stability and change in the minds of our ancestors during evolutionary time comes from stone tools, which date back to approximately 2.5 million years (Nowell & Davidson, 2010). Although we might often think of technology in terms of gadgets, really we should recognize that every technology, from a house to a piece of writing to a mobile phone, has three aspects: a certain kind of object in the world, skills to produce and use it, and a culture that supports its use (Oatley, 2013). Think of a bicycle: there's the thing itself, skills of production and riding, which include both the physical and the social, and then the cultural arrangements to make the earth flat enough to use wheeled vehicles. As far as stone tools are concerned, since their invention, there was a gradually increasing rate of change (Stout, 2011). The successions of these tools indicate that the minds that made and used them and the cultures in which they were useful could be stable for thousands of years. More recently the pace of change in what minds make has been increasing so that, as discussed by Oatley (2013), the first cave paintings appeared approximately 30,000 years ago, the first cities less than 10,000 years ago, the first writing 5000 years ago, and the first printed books 500 years ago. The first movies appeared not much more than 100 years ago, and the Internet expanded to a world-wide service only approximately 20 years ago. Such changes required creativity in the making, and they have invited creativity in the doings of people's day-to-day lives.

In perception, some cues of retinal images are interpreted by means that have been genetically programmed during our evolutionary past. Other cues are interpreted by means of learning during each person's individual past (Helmholtz, 1866/1962; Hinton, 2007) such that we learn to see a chair as an object to sit on and chopsticks as things to eat with. Learning depends on stability: the past predicts the present, and this has served our species well. But given the increasing rates of change in our recent history, the bias toward concentrating on stability is strong enough

that we might not perceive change, and some demonstrations of this are striking enough to be entertaining. Students in psychology classes have been much engaged by a video in which most of them do not perceive a change that is of a gorilla entering the scene to stroll among players who toss a basketball to each other (Simons & Chabris, 1999), or another video in which they don't notice that someone asking for directions on a busy street has been replaced, after an interruption, by someone entirely different (Simons & Levin, 1998).

Our minds and bodies are tuned for stability, tuned to perceive and react in predictable ways. At the same time we are thrown into a heaving sea of continual change. If we are sometimes unable to be creative, our inability to see an emerging reality, and an inability to act on it, appears to be at the very center of this lack.

The modern-day definition of creativity has two facets: a creative product must be both novel and appropriate/useful/relevant (Kaufman, 2009). The definition fits well the evolutionary challenge just described: how to perceive a complex ever-changing environment and to create products and engagements with them that explore and sometimes solve their complexities, or how to create something lasting such as a painting, a poem, or a dance, as a process of exploration. We map this problem onto the structure of self, and show how difficulties of being creative can arise from difficulties in the configuration of aspects of self-experience.

The model we present here is not quite scientific. To take up a distinction offered by Kozbelt, Beghetto, and Runco (2010), it is metaphorical. It is a model in the way a truck made of Lego blocks is a model. It is made of preexisting parts offered by others. Our contribution is to put them together in a way that we hope will provide interesting and useful insights. And, just as with a Lego truck, we hope that it will be taken apart by creative hands to make more interesting models in the future. Before we can map the problem of difficulties in creativity onto a model of self, we have to assemble a self.

ASSEMBLING A SELF

In his classic conceptualization, James (1890/2007) presented the self as an "I," the subjective agentic self (the doer/knower), and a "Me," the objective representational self (the known). He claimed that only the objective, representational Me is a proper subject of psychological investigation; he focused on it in terms of the construction, perception, cognition, motivation, awareness, and knowledge of self as represented in thought and language. The study of self has, however, expanded beyond James' idea. For instance, as we point out here, there is yet another self that behaves in ways that may not fit what James proposed. It does things no matter what
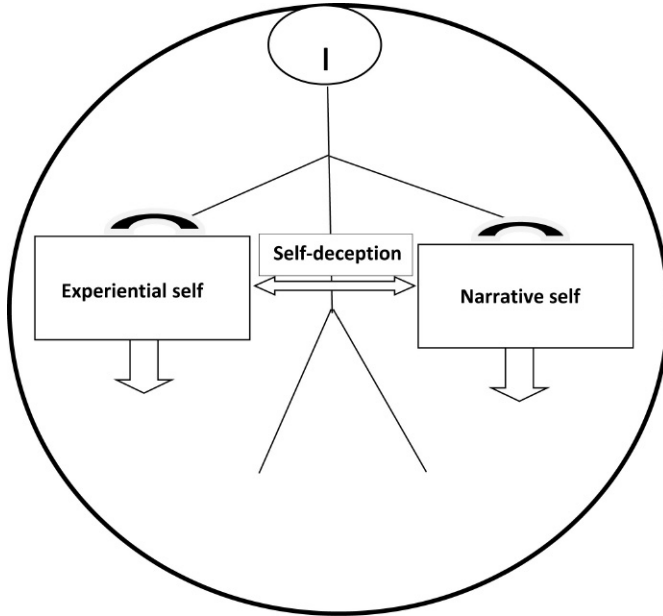
FIGURE 19.1   **Structure of self.**

the person perceives, thinks, or wants. In the subsequent text we describe three part-selves, whose totality represents a complete Self, depicted as a circle in Fig. 19.1. We assemble our self-model from several theories, and call the model the Weary Voyager because in her travels through life the whole Self, represented as a circle in Fig. 19.1, has to hold apart and carry the heavy weight of narratives she tells about the self, and the heavy weight of experience. We represented these weights as suitcases. They can burden the Voyager and make her too weary to bother much with creativity.

The I Self

In the stick figure of Fig. 19.1, the I represents conscious awareness of selfhood in relation to the environment. It falls asleep when we fall asleep, and wakes up in time to catch a glimpse in the bathroom mirror. This I may be similar to James' (1890/2007) conception of the self-as-knower, but it is more than his self-as-doer. In Fig. 19.1, the I is part of the whole Self, which is represented by the whole circle; this I is both a perceiver and an organizer of knowledge (Greenwald, 1980; Pratkanis & Greenwald, 1985), as well one aspect of self-as-doer. This argument also takes us to a point of distinction between the I presented here and Mead's (1934) "I," which "is the self of unconditioned choice, of undreamt hypotheses, of inventions that change the whole face of nature" (p. 35). According to the model

presented in this chapter, the I's agency, its capacity for making choices, is not unconditioned but is continually affected by and continually affecting the other parts of self, to which we next turn.

The Narrative Self

The representational aspect of self has been thoroughly studied in the 20th century (Cooley, 1902/1922; Goffman, 1959; James, 1902; McAdams, 1993, 1995, 2001; Mead, 1934). Whatever we think, believe, or verbalize about ourselves is in this category. The Narrative Self derives from what Bruner (1986) called the narrative mode of thought, which is about agents, their intentions, and the vicissitudes these intentions meet. He contrasted it with the paradigmatic mode of thought, which is about understanding and explaining how things work in the physical world. The Narrative Self is the only part of Self that is truly temporal; its structures are such that they extend over time. It is continually constructed, and it can become distorted (Gergen & Gergen, 1988; McAdams, 1993, 1995, 2001). It is also unbounded, that is, it can shade naturally into various kinds of nonself (James, 1890/2007).

The Narrative Self is based in language, thought to be perhaps 200,000 years old (Dunbar, 2009). It's our verbalized thoughts about ourselves, thoughts that we may keep to ourselves and sometimes tell to others. Such thoughts include those that the authors of this chapter are writing here about selfhood, and those that you as a reader might have about your selfhood as you read.

In the Narrative Self, the I relates to James' "Me" in the same way that an author of a novel relates to a character, perhaps the narrator, in that novel (Mancuso & Sarbin, 1983; Sarbin, 1986). The idea of a Narrative Self is, indeed, an excellent metaphor for the knower as she is able to construct a story of herself to herself and others. The metaphor emphasizes the infinite number of possible constructions. We can have actual or possible selves (Markus & Nurius, 1986), undesired selves (Ogilvie, 1987), ideal and ought selves (Higgins, 1987), and individual and collective selves (Simon, 1997). The metaphor also guards against oversimplification in terms of the truth of the narrative. Is the narrator reliable? Are our narrative selves true to us? True to others? Are characters true to the author? The issue of accuracy of the narrative, however, may be better approached not from the perspective of the content of the story, but rather from the motivation of the author, and the degree of distortion that can be introduced into the story to fit the author's motivational goals. The narrative metaphor illustrates the extent to which the Narrative Self can become a story of another who is not really the self, and to this extent the constructed self is unbounded. We can, for instance, read narratives of others and adopt them as if they were us.

The narrative metaphor points to the vulnerability in the conception of Self, given that the step from character-as-narrative-self to self-as-narrative is very small. Within the Narrative Self, it becomes easy to believe that a character is the author, rather than that the character relates to some aspects of the author. Mistaking an agent for a story of an agent—mistaking the whole Self for a story that the I makes about the Self—is very easy, particularly when the narrative metaphor becomes increasingly complex, as Bakhtin (1929/1984) argued, in his *Problems of Dostoevsky's Poetics*. Bakhtin proposed that Dostoevsky's characters are not dependent on central authorship, but are independent ideological and motivational structures; they in fact have different selves. This means, then, that each character in the kinds of novel about which Bakhtin writes is her own autonomous I. This idea was further elaborated and applied to the self theory by Hermans, Kempen, and Van Loon (1992), who argued that self is a collection of "relatively autonomous 'I' positions within an imaginal landscape" (Hermans, 1996). The psychological understanding of the Narrative Self was thus moved forward by understanding it as a potentially autonomous agentic force. The Narrative Self, does, indeed have causal relations to other components of Self, and the idea of dialogical or multivoiced self (Hermans, 1996) can perhaps be best understood in terms of that interaction. Yet we must guard, in our own minds, against the too-easy supposition that what we think of our self is the entirety of Self.

The Experiential Self

The Experiential Self derives from our genetics and from the history of all imprints that experience has left on us, no matter the stories we weave about ourselves. It is affected by learning, by the fact that experiences leave their marks on our bodies and psyches. In his Cognitive–Experiential Self Theory, which focuses on rational/analytical and holistic information-processing styles, Epstein (1973, 1994) calls this system "experiential." The Experiential Self is the source of our urge to have another piece of chocolate or to make plans to see a certain person in whom we are interested, of our emotions of affection, of anger, of fear, of contempt. It can affect the entirety of the Self that is represented by the circle in Fig. 19.1, to act even if the action violates dictates of the Narrative Self, as, for instance, when a person who has determined to give up drinking has a glass of wine, or two, or when a person who has vowed not to worry over matters about which she can do nothing gets caught in repetitive anxiety. The Experiential Self interacts with the Narrative Self, because experiences affect our verbalizations, and it also interacts with our conscious awareness. It can easily bypass the conscious awareness of the I, and make us act automatically. Bargh and Chartrand (1999) and Bargh and Ferguson (2000) have drawn attention to both activation and pursuit

of unconscious goals, pointing to a large prevalence of automatically activated behaviors.

The temporal nature of the Experiential Self is difficult to understand because we cannot refer to the apparent temporality of experience without thinking verbally about it. If I tasted a sweet cherry when I was 2 years old, an experience that left me with a lifetime predilection for sweet cherries, my experience at that age was atemporal. It was an experience of the I in the now, as is my continuing predilection for sweet cherries in the present day now. Being nonnarrative, it is not constructed. Memory researchers advise us of the constructed nature of our memories (Loftus, 1996; Schacter, 1999). Although it may change rapidly, experience as such is not ambiguous. By contrast, our memories and interpretations of experience are narrative, constructed, and open to ambiguity. Perhaps my memory is flawed. Perhaps I never tasted a sweet cherry when I was aged 2. Perhaps my belief in the causal relation between the memory of experience and my lifelong cherry predilection is false. What I believe is irrelevant to the fact that experience as such can leave imprints, and that these imprints can themselves act as motivating agents. The Experiential Self is affected by the history of these imprints.

The Circle of Self

If we consider the totality of Self, a configuration of three interacting selves, each of which affects the other two, we get the sense of a certain complexity. In Fig. 19.1, this Self is represented as a circle, which can be moved by any of its three parts, or any combination of them. Now that we have assembled the Self, we can show how different configurations produce different kinds of difficulty with creativity.

THE WEARY VOYAGER MODEL

Let us assume that creativity depends on an adaptive response to an accurate perception of a changing reality in the world. This assumption violates the accumulated glamor of creativity as a special and unusual response that is different from what the majority of us could do in everyday life. The aura of specialness or even madness that often characterizes creativity is born of not seeing what creative perception allows; it is like being amazed at a person who is lifted along in the air, and makes strange movements and contortions, but without our being able to see the horse the person is riding. Individuals whose self is configured to see reality more accurately can see the horse, and can even ride it, while the rest of us, unseeing, may be left to imagine stories of madness and magic.

There are three ways in which the accurate perception of reality, which is required for creativity, can fail. These ways are represented in Fig. 19.1 as three ways by which the wayfaring Self is burdened on the path to accurate perception. She can be burdened by self-deception, which can be thought of as the distance, or strain, between the Narrative Self and the Experiential Self. She can be burdened, too, by the weight of the Narrative Self and the weight of the Experiential Self. As you can see from Fig. 19.1, the stick-figure Self holds her two heavy suitcases—the Narrative Self and the Experiential Self—widely apart. In this way, she makes them more difficult to carry. No wonder the Self is weary as she makes her way. To perceive her Self and her doings in the world more accurately she might reduce the strain on her arms by decreasing the distance between her suitcases, and might lighten the load of each one. Were she to do this, she might make her way in a fashion that is less reactive, more creative.

Distance Between Narrative and Experience

Creativity can be thought of as a novel and productive response to reality; it requires accurate perception of that reality. The first problem with the accuracy of self-perception is that narratives, like memories, are constructed representations of experience, and as such are selective. The story of ourselves we tell when we apply for a job is different from the one we tell when we are on a first date; this difference need not be of distortion, only of relevance. But distortion can and does occur. Given that narrative and experience belong to different temporal and ontological categories, one could reasonably ask what it means for a narrative to be distorted. Is it reasonable to use the term "distortion" to describe the relationship between constructed narratives and the experiences they represent? We propose that distortion can be appropriate, but only when referring to the motivational predisposition of the narrator, rather than to the content of the narrated experience. For example, any particular experience is like taking a sip of coffee in a café. The experience can contain limitless bits of information, and these require selection and construction. The narrative is distorted if a particular motivational predisposition leads one selectively to ignore or to attend to a certain set of issues. For example, a fight with a friend will have innumerable aspects, some of which might be ignored consciously or unconsciously. We argue that a narrative of an event is distorted if the person is motivated systematically to discount particular kinds of information, for instance, those that show the friend to be right about some aspect of the argument. This does not refer to a necessarily self-centered perspective while accumulating or organizing our knowledge (Greenwald, 1980), but to motivated distortion. This distortion, when automatically processed, is known as self-deception (Sartre, 1975; Peterson, 1999). Goleman (1996) conceptualizes self-deception as

a psychological version of the endorphin system: it allows us to escape a danger before we are consumed by the pain it produces, and so protects a fragile self-system. Self-deception is not just about the Self. It can be about others, for instance, "they are out to get me," or about the world, "I'm the only one who does any work around here." No matter what the target of self-deception is—self, others, or the world—accurate perception is impaired.

Why should discrepancies between narratives and experience be harmful to creativity? After all, some psychologists argue that constructing one's reality through rose-colored glasses can have positive effects by inspiring optimism, a sense of well-being, and competence (Taylor & Brown, 1988). The problem is similar to that of looking for a city landmark using a map. Even if one finds the landmark on the map, and knows how to use a map, if a person is mistaken about where she or he is according to the map, if she or he does not represent her or his experience accurately, the landmark will not be found. This will be the case even if she or he feels optimistic about being right about her or his location on the map. It is for this reason that self-deception, which in Fig. 19.1 is represented by the distance between the Narrative Self and the Experiential Self, affects accuracy of perception. Accuracy is needed for creative (novel and productive) responses to reality. It would be difficult to find an inventor who made an extraordinary discovery, or a musician who composed a masterpiece, who did not acknowledge distressing truths about some preinventions or compositions as being wrong, or as needing more work, or a myriad of other unpleasant realities, all of which needed to be perceived and addressed, before a creative work was accomplished.

Rigid Attachment to the Narrative Self

One of the most common tests of creative fluency is asking for multiple uses of a simple object such as a pen. It is a part of one of Guilford's (1967) operations—divergent thinking—which includes fluency, flexibility, originality, and elaboration. Langer and Piper (1987) found that when undergraduates were introduced to objects in a conditional manner (e.g., "this could be a pen"), they outperformed undergraduates who were introduced to the same objects unconditionally (e.g., "this is a pen") on measures of creativity that involved using the object for a novel purpose. Narratives of self may function in much the same way. They are necessary as guides for both organizing the past (making chronological meaning of one's life) and future planning, goal orientation, choice making, and so on. Categorical rather than conditional narratives of self are likely to stymie creativity. So what is it about a rigid attachment to a narrative such as "I had a happy childhood" or "I want to be the kind of person who exercises every day" that even when they are accurate (with selection and

processing of information being unaffected by motivational purposes), they can interfere with perception, and hence with creativity? We propose that the level of resolution for many narratives to which we are rigidly attached is often too low to maintain accuracy over a continually changing present—any story that is broad and rigid will eventually lead to its own distortion, which will weigh us down.

Let us start with the past. A rigid attachment to a narrative of the past (e.g., "I had a happy childhood") factifies that past, ignoring both the constructed nature of our remembering and the continually emerging nature of Self. The motivational changes that occur during adulthood require re-understandings of narratives of the past, so that it can inform the present in a clearer manner. The continually emerging present requires fluidity in understanding of how the past informs it. Ideally, the past would be covered by a narrative as flexible and light as a translucent veil, so that newly emerging goals and circumstances can be informed by peering through the veil and gathering content that will best inform us. If a significant part of the narrative past is just a never-changing lump, we cannot accurately perceive either the past or the present.

In terms of the narratives of the future—our goals and plans that inform our daily action—the situation is similar. We argue against rigid attachment to future narratives of the self, even if the content of the narratives appears to be good. For example, let us examine a narrative of wanting to be a kind person. Some would argue that rigid attachment to the positive future narratives epitomizes uniquely human ability for self-improvement. The problem, again, is in the motivated necessity of needing to be (and to see oneself as) a person who is kind. One can be kind, and believe that for the most part one is kind. But if one incessantly needs to be and believes oneself to be such an ought self (Higgins, 1987), it becomes more difficult to perceive the continually changing nature of what is, and to act upon it.

The weight of a rigid narrative of self can be seen as an obstacle for creative achievers. Once being creative becomes an identity rather than a flexibly creative state of being, it can produce the very rigidity of a Narrative Self that can block further production. This occurs in the anguish over creative blocks from which many artists suffer. The very doubt about their own creative capacity, and the compensatory attachment to the artist identity, can begin a cycle of rigidity, doubt, more rigidity, and more doubt, while the subtleties of the emerging self in relation to emerging world remain unnoticed.

Rigid Attachment to the Experiential Self

The weight of experience can be framed within the evolutionary perspective discussed previously. The relative stability of the environment

has favored stability in learning outcomes that can sometimes persist for longer than is adaptive in the light of changing circumstances. The body and brain, which hold these patterns, rely on perception and they are contributors to perception. Groopman and Prichard (2007) have observed that doctors who see a particular ailment many times in a row can misdiagnose a new patient because they more easily perceive the new syndrome as the pattern that has become familiar. Similarly, Duncker (1945) showed that individuals' familiarity with the way that objects are traditionally used prevents them from solving problems that would require a novel use. He called it "functional fixedness." A person sent to a company to solve a challenging situation may be able to behave most creatively only if he or she sees ways in which that company's problem is different from problems he or she has encountered in other companies, and act on what he or she perceives, rather than acting automatically on problems he or she knows how to solve. Prior experience can move the Self system automatically, often with minimal processing by the mind (Bargh & Chartrand, 1999; Bargh & Ferguson, 2000). Reenactment of old behavioral patterns without regard for changed circumstances is at the root of what Langer calls "mindlessness" (1997), which is antithetical to creativity.

Seeing the past as the present, with the inability to see current circumstances as they are, is particularly difficult for those who suffer from posttraumatic stress disorder (PTSD). Van Der Kolk (2014) suggests that people with this disorder are often suspended in time: the threat of the past is still in the present. Their plight is an accentuated version of what many of us experience, as we carry out action based on what we perceive in our minds rather than in the world. Lightening the weight of experience can allow nonmindless, noncompulsive action on what is there, rather than what is in the past, or what we already know how to act upon.

IMPROVING CREATIVITY

Most creativity-development workshops have creative process at their center, and often the process is illustrated by working on a creative product relevant to a particular domain. In this chapter we suggest a different way to improve creativity: by cultivating accurate perceptions of the Self and the world. The three aspects of self-experience that we have discussed, which impede creativity—the strain of self-deception, the weight of the Narrative Self, and the weight of the Experiential self—can be reduced by different methods. All parts of the Self interact, and therefore all the methods will affect all the parts. The optimal configuration of Self with regards to creativity, with little self-deception (distance between Narrative and Experiential Self), and little Experiential and Narrative baggage is shown in Fig. 19.2.
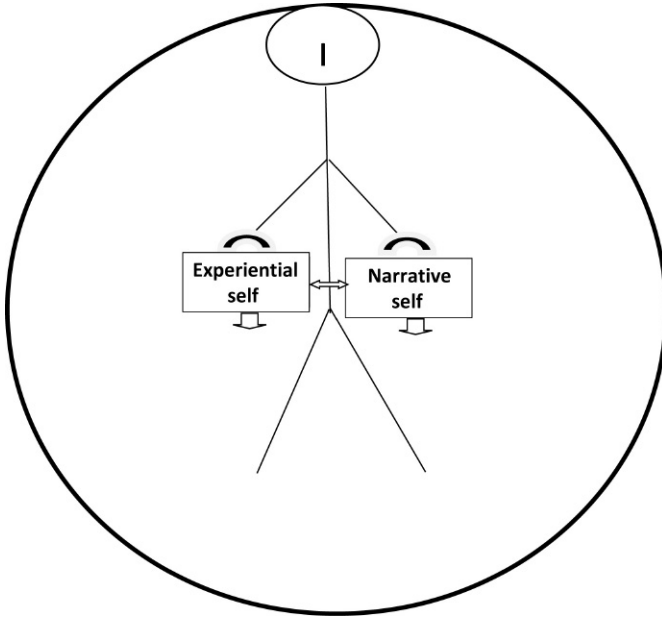
FIGURE 19.2   Creative self.

Self-deception is best addressed by observation: of thoughts, of emotions, and, most importantly, of behaviors. Observation of behaviors is particularly relevant when the self acts in a manner incongruent with self-narratives. Working on the weight of the Narrative Self is perhaps best accomplished by cultivating a multiplicity of flexible self-narratives. The most difficult of the three—the weight of the Experiential Self—can be best addressed by mindfulness: both Western mindfulness and Eastern meditation-based mindfulness.

Western mindfulness techniques are based on work by Langer (1989, 1997, 2005, 2009); they focus on making novel distinctions about objects in one's awareness, including the Self. By requiring a multiplicity of categorizations, past categories can be widened and changed, to focus the perceptual system on what is there. By contrast, the aim of Eastern meditation methods is for the Self to become less affected by messages from the Experiential Self (Djikic, 2014). Usually, when our body sends our mind a message, for instance, a message of anxiety from which it is difficult to escape, or a message of an urge to do X, we are taken up into our anxiety or we do X. When a message of this kind occurs while we are meditating, we let it first come into the mind, and then let it pass out of the mind. One might have reservations about this method because it grew from a cultural attitude that emotions are destructive and increase suffering. Stoicism in the West had much in common with this tradition.

More recent understanding of emotions is that they derive from our Experiential Self and let us know that when an event in the world affects a goal or concern, we need to attend to it (Oatley & Johnson-Laird, 2014). It is principally the emotions that become stuck in the past such as chronic anxiety states and depression that need to be enabled to pass out of the mind, so that they are less likely to keep going round in there. In this way mindfulness has become an important component of psychological therapies for anxiety states and depression (see, e.g., Szabo, Long, Villatte, & Hayes, 2015). In this way the I and the Self can become less weighed down by the insistence of the Experiential Self. Both types of mindfulness, therefore, can enable clearer perception and acting on present rather than past categorizations (Djikic, 2014). As such both of them are likely to allow the Self to act more creatively on the world. A recent meta-analysis by Lebuda, Zabelina, and Karwowski (2016) discovered a small-to-medium effect size relationship between mindfulness and creativity, which has been shown to be not only correlational but causal as well.

CONCLUSIONS

Creativity is often seen as extraordinary, even magical. Yet at root it is perhaps the most basic of all phenomena—an ability to see and act on the Self and the world as it is, not as feared or wished for. Developmental theories of creativity often focus on what needs to be done externally to foster creativity. Here we address what needs to be done internally to foster creative thinking about newly changed events when they occur. Reducing self-deception through observation, maintaining a flexible Narrative Self, and cultivating mindfulness to reduce the weight of perpetuities in the Experiential Self might not seem as appealing as creativity workshops that promise 3 hours of fun and a brand new creative you. Work on oneself is lengthy and can at times be frustrating, but it may open doors to creativity to help worthwhile action in the world. As Voyagers made weary by holding apart the heavy suitcases of our Narrative Self and our Experiential Self, we can gently relax. We can allow the suitcases to come closer; we can take out and discard some of the more heavily weighing contents and, as we feel less weary, we can explore the world outside and the world within not as how we would like them to be, not as they have been, but as how they are.

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From Having an Idea to Doing Something With it: Self-Regulation for Creativity

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In an early biography of Thomas Edison, an interaction in his laboratory is recounted where his achievements were attributed to genius. Edison's comment was: "Stuff! I tell you genius is hard work, stick-to-it-iveness, and common sense" (Dyer & Martin, 1910, p. 607). More famously, he stated that genius is 1% inspiration and 99% perspiration. Edison might have been the most famous creator to formulate this view of eminent creative achievement, but he was neither the only one nor the first to do so. In a lecture on the nature of genius in 1893, the American lecturer and author Kate Sanborn stated that "Genius is inspiration, talent, and perspiration" (genius-ratio, quoteinvestigator.com, n.d.). These quotes concisely capture the emerging consensus in creativity research—creativity is a result of confluence of factors, where some pertain to personal qualities of creative potential and others pertain to factors that enable realization of that potential. In this chapter we focus on the latter.

Research on creativity in the workplace shows not only that the creative process is largely perspiration but also that idea generation is not the most challenging aspect of the process. Birkinshaw, Bouquet, and Barsoux (2011) studied 123 companies and found that managers reported they were highly effective at generating new ideas, but less effective at selecting promising ideas and developing ideas into products and services. These findings stress the importance of understanding the process of how creative ideas get successfully turned into creative products. We briefly review major areas of research on creative potential (in terms of cognitive ability, motivation, and personality) and creative products, and then in

detail examine the process between coming up with ideas and actualizing ideas into performances or products.

Creativity is commonly assumed to be based on a confluence of personal and social factors. In her influential componential theory, Amabile (1996) postulates the central role of intrinsic motivation for creativity—creative individuals tend to be motivated by internal needs for enjoyment of an activity and perceived challenge, as well as social conditions that support or undermine intrinsic motivation (e.g., controlling rewards weakening intrinsic motivation; Hennessey, 2000; Shalley & Perry-Smith, 2001). The model also stresses the role of creativity-relevant traits and skills (relatively general across domains, e.g., being open to experiences) and domain-relevant skills (e.g., spatial ability for architects). These personal and social factors form potential for creativity or the right conditions under which creativity can be manifested.

Studies of cognitive abilities involved in creativity most commonly examined intelligence and divergent thinking. The relationship between creativity and intelligence is one of the oldest areas of research in the study of creativity (e.g., Cox, 1926). Recent studies have found a strong relationship between fluid intelligence—which involves cognitive control, working memory capacity, interference management, and use of strategies (Conway, Kane, & Engle, 2003; Unsworth, 2010)—and creativity (Beaty, Silvia, Nusbaum, Jauk, & Benedek, 2014; Gilhooly, Fioratou, Anthony, & Wynn, 2007; Nusbaum & Silvia, 2011). This relationship is further clarified as depending on processes such as long-term memory retrieval and executive function (Avitia & Kaufman, 2014; Benedek, Franz, Heene, & Neubauer, 2012).

Divergent thinking abilities, defined as a "broad search for logical alternatives" that results in the production of multiple ideas to an open-ended problem (Guilford, 1975, p. 40), have been often used as synonymous with creativity itself (e.g., Torrance & Presbury, 1984). Divergent thinkers are able to generate a large number of responses that satisfy a certain criterion (fluency) and produce responses that depart from the ordinary and obvious (originality). In concurrent validity studies divergent thinking predicts creativity ratings by knowledgeable others and self-reports of creative activity (e.g., number of creative products; Guastello, 1992; King, Walker, & Broyles, 1996). In longitudinal studies, divergent thinking in elementary or middle school predicts creative achievement and career aspirations even 22 years later (Torrance, 1972, 1981, 1988).

Finally, a large body of research on creative personality converges in identifying openness to experience as the most important trait that indicates potential for creativity. Openness to experience predicts creativity across domains, including everyday creativity shown in self-expressive behavior or arts and crafts activities, performing arts, and sciences

(Feist, 1998; Ivcevic & Mayer, 2009), as well as in relation to different criteria for creativity, from divergent thinking tests, laboratory performance measures, and real-life behavior and creative achievement (Carson, Peterson, & Higgins, 2005; Ivcevic & Mayer, 2009; King et al., 1996; McCrae, 1987; Wolfradt & Pretz, 2001).

In addition to having a rich understanding of creative potential, we also know much about creative products. Amabile (1983, p. 31) posited that:

> A product or response is creative to the extent that appropriate observers independently agree it is creative. Appropriate observers are those familiar with the domain in which the product was created or the response articulated.

Several decades of research demonstrate high agreement among expert judges (Amabile, 1983, 1996; Baer, 1993, 1998; Baer, Kaufman, & Gentile, 2004; Baer, Kaufman, & Riggs, 2009; Hennessey & Amabile, 1999), and judges agree on creativity across cultures (Hennessey, Kim, Guomin, & Weiwei, 2008). Experts agree in their creativity judgments more than novices across domains (flower design: Lee, Lee, & Youn, 2005; poetry: Kaufman, Baer, Cole, & Sexton, 2008; mousetrap design: Kaufman, Baer, Cropley, Reiter-Palmon, & Sinnett, 2013). Furthermore, experts and novices do not agree with each other (Kaufman, Baer, & Cole, 2009; Kaufman et al., 2008) and experts are more discerning in making their judgments (Lee et al., 2005; Locher, Smith, & Smith, 2001; Silvia, 2006).

With such a wealth of knowledge about creative potential (in terms of motivation, cognitive abilities, and personality), as well as creative products, the question becomes why don't we know more about what happens between having an idea and realizing it in final products. One clue might be in the nature of research methods preferred by our field and pragmatics (e.g., cost and time) of doing long-term studies. As Csikszentmihalyi (1999) described, the field and its gatekeepers (journal reviewers and editors, tenure committees, funding agencies) directly and indirectly decide what work is done and what is included in the domain. Most highly valued studies are experimental and thus short (Baas, De Dreu, & Nijstad, 2008), usually measured in minutes rather than days or months, which would more realistically reflect the nature of real-life creative work. This methodological artifact might be in part to blame for the dearth of research on self-regulation processes in creativity. For instance, persistence does not predict creativity on short laboratory assessments of creativity (Lubart & Sternberg, 1995), but it does in longitudinal studies that examine long-term occupational creativity (Helson, Roberts, & Agronick, 1995).

The past couple of decades witnessed a major increase in the research on self-regulation (e.g., Magen & Gross, 2010; Mischel, 2012; Mischel, Cantor, & Feldman, 1996; Muraven & Baumeister, 2000). Self-regulation

"emerges not only in the goals that individuals set, but in their styles and strategies of pursuing them over time and coping with associated challenges, temptations, and frustrations" (Mischel et al., 1996, p. 329). Social psychologists have identified several broad groups of factors involved in self-regulation: goal setting, expectancies about one's capacities to handle the tasks, values and standards for evaluating progress toward goals, and strategies for enacting and controlling behavior (transforming intentions into actions; Mischel et al., 1996). Expectancies refer to people's beliefs about what they are able to do and are crucial regulators of goal setting, as well as effort invested into working on these goals. In addition to the belief that one is able to be successful at a task, behavior is guided by a value attributed to the task. Self-regulation of behavior (e.g., persistence) is more successful when the task is perceived as contributing to one's interests, identity, or higher-order goals. Finally, intentions are transformed into actions through either interpersonal or environmental control strategies (e.g., creating conditions that increase the likelihood of entering the rewarding state of absorption in a task).

This research has taught us much about the successful goal pursuit. However, this research has focused on specific kinds of goals, such as exercise (Delose, vanDellen, & Hoyle, 2015), smoking cessation (Shadel & Cervone, 2011), and adherence to cancer screenings (Lechner & de Vries, 1997). What is common to these kinds of goals is that they are relatively well defined. For example, the American Cancer Society offers clear guidelines for the frequency and manner of self-breast examinations for early detection of tumors (American Cancer Society, n.d.). Reaching the goal of regular self-examinations does not require finding and formulating the problem, as is the case with ill-defined, open-ended creative tasks (Lubart, 1994). Similarly, the actions necessary to reach the goal are specific and can be learned from a primary care physician. Actions toward a creative product are much less clear and strategies that one devises often have to be revised when they do not lead to desired outcomes. Finally, goal attainment is clear-cut in the case of many health-related behaviors and much less so when working on a creative goal (e.g., it is often times not possible to anticipate the comments of reviewers or critics who decide whether the product was successful or not). Because of these reasons, we argue that self-regulation toward creative goals presents some unique challenges and should lead to a distinct area of research.

We propose that self-regulation for creativity involves two groups of processes (Fig. 20.1): (1) revising and restrategizing on the way from the creative idea to a completed product; and (2) sustaining and maintaining effort in the face of obstacles and discouragement. Why are these two areas crucial? Creative work is ill-defined and the creative process includes by necessity many revisions, reformulations, and adjustments, as vividly described by creators in a variety of domains (Botella et al., 2013; Bourgeois-Bougrine
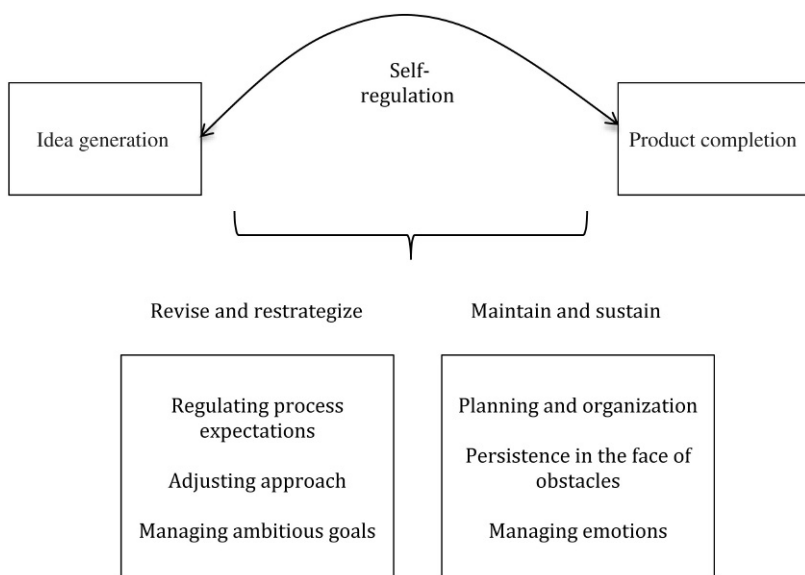
FIGURE 20.1   Self-regulation for creativity.

et al., 2014; Glăveanu et al., 2013). Csikszentmihalyi (1988) argued that this continual exploration and revision is the fundamental feature of creative work and labeled it problem finding. In a classic study, Csikszentmihalyi and Getzels (1971) set up a studio in their laboratory and asked art students to create still-life drawings. They were given 30 objects to choose from and the artists were observed in their creative process. Artists who spent more time picking up the objects, feeling their weights and textures, manipulating objects, and trying to work their mechanical parts made the most creative drawings. The more successful artists spent a lot of time playing with objects, revising their ideas and their approach.

We argue that in addition to this process of problem finding, creative individuals manage their work process by adjusting their approach when facing obstacles or new information. They are willing to take risks and manage these risks so that their goals are not so high to be unachievable or unappealing to the field, and not too low that they are not making a significant contribution to the domain of work (Sternberg & Lubart, 1991). In order to achieve this, creative individuals have to understand the nature of the creative process. Although they are primarily motivated internally (Amabile, 1996), they are aware that not all aspects of their work will be enjoyable and that the final product will likely be different from what they initially envisioned.

The second set of self-regulation processes concerns the often long path toward finishing the work. What is necessary for individuals to persevere in spite of uncertainties, obstacles, anxieties, and disappointments of

creative work? Planning is important in order to create a balance between fully unstructured work where many competing goals can be activated in the mind at any given time (diminishing one's cognitive resources) and being rigid in having too much structure. Creative individuals persist in their work, even in the face of substantial obstacles (Helson et al., 1995; Wilson, 1990), aided by their intrinsic motivation for a domain of work (Amabile, 1996) and a repertoire of strategies to motivate oneself for less pleasant or even painful aspects of work.

Finally, creative work is replete with emotions, from the anxiety of a lyricist facing a new tune (*Where do I go from here?*) to frustration when a priming procedure does not activate a specific aspect of social identity in a psychology experiment, to aggravation or even anger after a theatrical performance is poorly reviewed. Much research examining the role of emotion in creativity focused on establishing what emotion states inhibit or facilitate creative idea generation (e.g., Baas et al., 2008). In contrast, we argue that it is one's response to these and many other emotions that is more important for creativity. Managing emotions involves harnessing and influencing one's own and emotions of others who are involved in the creative process (e.g., leaders inspiring employees and responding to failures so that they are more likely to be perceived as opportunities for learning and growth than inhibiting events).

In the subsequent text we describe each of these groups of processes and illustrate them in relation to creative behavior across domains.

REVISE AND RESTRATEGIZE

Regulating Process Expectations

> There is always, of course, that terrible three weeks, or a month, which you have to get through when you are trying to get started on a book. There is no agony like it. You sit in a room, biting pencils, looking at a typewriter, walking about, or casting yourself down on a sofa, feeling you want to cry your head off. […] And yet it seems that this particular phase of misery has got to be lived through. *Christie (1977, p. 458)*

Creative individuals implicitly or explicitly understand the nature of the creative process. Even though creative individuals tend to be intrinsically motivated for their area of work, they understand that the creative process is not uniformly enjoyable, but includes difficult (or even misery-filled) periods. While creative work begins life as an idea or a hunch, the actual outcomes may be quite different than what was initially envisioned. The changes in ideas and approaches to their realization mean that creative people need to be aware of inherent uncertainties in the creative process and that they have to be tolerant of working in the face of risks in order to advance their work.

Agatha Christie anticipated a phase of misery in the process of writing. She was aware of the recurrence of this phase and, although unpleasant,

was able to manage it and live through it to write yet another book (and she wrote 80 books!). Interviews with creative individuals in different domains suggest a similar awareness of the nature of the creative process and its vicissitudes (Botella et al., 2013; Glăveanu et al., 2013). Across five domains, Glăveanu et al. (2013) showed that creators are able to describe their creative activity as starting with a vision or an idea, followed by reflection, exploration or modeling and testing, and revising or editing. Along the process, obstacles of different types are encountered. For example, artists start with a general vision, which is usually incomplete (an obstacle to be overcome: inability to visualize the idea), followed by experimentation through sketches (and overcoming obstacles related to materials and tools used), until they finally create an object or a series of works. Creators in domains as diverse as the visual arts, music composition, design, scriptwriting, and science describe their expectations of having to continuously revise and rework on the way to the final product. In the words of a scriptwriter, "you write something, you have it read, you re-write it, you have it read" (Glăveanu et al., 2013, p. 10).

Creative individuals come to expect ambiguity and uncertainty in the creative process—from relatively unspecific initial ideas or questions to many possible routes to their actualization. Although ambiguity is expected, it can negatively impact one's work progress. Too many options without clear direction can paralyze decision making (Iyengar & Lepper, 2000; Scheibehenne, Greifeneder, & Todd, 2010). Being overwhelmed by multitude of options can lead people to question their abilities and goals and result in procrastination (Pychyl, Lee, Thibodeau, & Blunt, 2000; Sirois & Pychyl, 2013; Steel, 2007; Tice, Bratslavsky, & Baumeister, 2001).

Organizational research has long recognized that regulation of expectations for long-term projects helps project outcomes. To aid with regulation of expectations, project management researchers developed the critical path analysis technique, which helps people to anticipate and address obstacles (or their consequences) by analyzing how different tasks relate to one another (Caughron & Mumford, 2008; Cleland & King, 1975). This analysis is especially important for creative work that inherently involves substantial degree of ambiguity. Supporting this assertion, Caughron and Mumford (2008) demonstrated that using critical path analysis at the beginning of a project helped avoid or mitigate the impact of risks and uncertainties in the creative process, over and above the impact of planning specific tasks to be done.

Adjusting Approach

The thing about that experience of having to adapt in the moment with what's there is that it happens to me all the time. It's not that it just happened to me once at the beginning. *Guggenheim Fellow sculptor Janet Echelman (Raz, 2015)*

Skinner (1982) famously said that when one runs into something interesting, they should drop everything else. Dropping whatever one is doing for a new interest or promising idea represents one important adjustment in creative work—recognizing ideas that are worth pursuing even at some cost (to previous goal commitments or productivity). These unexpected opportunities arise primarily through deliberate problem exploration and problem finding (Csikszentmihalyi, 1988). However, dropping everything one is working on because of a new opportunity has to be balanced with the need to achieve goals and transform leads or initial ideas into finished products. Thus, creative individuals embody both an openness to opportunities and an ability to commit to specific goals.

Csikszentmihalyi (1988) has argued that problem finding is the crucial aspect of the creative process and that it distinguishes creativity from similar processes (e.g., problem solving). Problem finding spans the whole creative process, from searching for initial ideas to defining and outlining those ideas, to examining and developing approaches to bring ideas to life. Thus, problem finding is in itself a process of adjustment. In their study of problem finding, Csikszentmihalyi and Getzels (1971) found that art students who spent more time adjusting and manipulating still life objects, examining their weight and texture, created more creative drawings. This adjustment referred to manipulation of physical objects, but in other domains adjustment can take a form of modifications in methods how to address ideas (e.g., using a variety of measurement approaches in a psychology study), changes in mediums (e.g., an idea for a painting becomes a collage), or changes in the initial idea (e.g., writers describing that stories and characters take a life of their own and take them in unexpected directions). Furthermore, adjustments in the creative process are made because of material, technological, or timeline constraints and obstacles (Glăveanu et al., 2013).

How does problem finding happen? Creative individuals tend to have wide interests (Barron & Harrington, 1981; Feist, 1998) on which they can draw in the process of exploration. Active observation, learning, and exploration are common to problem finding across domains, from historical research (McCay-Peet & Toms, 2010) to the arts and science (Botella et al., 2013; Glăveanu et al., 2013). Scientists tend to build on observations, previous literature, and discussions with colleagues; similarly, screenwriters describe drawing on books and movies and constantly being open to observations (Glăveanu et al., 2013). Problem finding is facilitated by social interactions that increase the likelihood of being exposed to a broad range of ideas, such as interactions in a diverse work team (Stahl, Maznevski, Voigt, & Jonsen, 2010). Similarly, weak ties—relationships characterized by infrequent interactions, relatively low emotional closeness, and one-way exchanges (e.g., work-related conversations without emotional attachments)—are generally beneficial for creativity (Perry-Smith & Shalley,

2003; Zhou, Shin, Brass, Choi, & Zhang, 2009). When ideas are shared within diverse social networks (Reiter-Palmon, Wigert, & Vreede, 2012), they can be explored from different perspectives in a manner similar to art students physically manipulating still life objects in Csikszentmihalyi and Getzels' study (1971).

Creative individuals are able to harness the advantages of defocused attention (constant observations of the world around them) because they possess stronger executive function abilities (Beaty et al., 2014; Gilhooly et al., 2007; Nusbaum, Silvia, & Beaty, 2014). For instance, Healey and Rucklidge (2006) found that creative and less creative children with symptoms of attention-deficit disorders show similar levels of novelty-seeking behavior. However, creative children with attention-deficit symptoms performed better on measures of self-directed behavior and executive functioning than noncreative children with attention-deficit symptoms. On a level of behavioral descriptors, Helson et al. (1995) found that people described as having wide interests, but also not reluctant to commit oneself to a course of action at ages 21 and 43 were more creative in their occupations at age 52.

Managing Ambitious Goals

Managing ambitious goals involves regulating risk in setting goals and regulating when to disengage in case goals become judged as unfeasible. Creativity is inherently associated with risk—risk that original ideas will not "work" (that the business venture will fail or that a study will not show significant results) and risk for one's social standing and reputation (follow-up movie being a flop or published results not being replicated). These risks have to be managed to maximize impact of one's work and minimize potential negative consequences. Similarly, achievement striving predicts more successful problem construction, problem solving, and creative accomplishment (Mumford, Costanza, Threlfall, Baughman, & Reiter Palmon, 1993; Reiter-Palmon, Illies, & Kobe-Cross, 2009). However, in this process of pursuing ambitious and risky goals, individuals occasionally realize that the initial goal is unattainable and needs to be reformulated or abandoned.

A decision whether to take a risk involves cognitive appraisals of magnitude of the risk and benefits coming from achieving risky goals (Weber, Blais, & Betz, 2002). Nicholson, Soane, Fenton-O'Creevy, and Willman (2005) identified three types of risk-takers: stimulation seekers, goal achievers, and risk adapters. While stimulation seeking is related to impulsivity, goal achievers and risk adapters are not unafraid of risks, but are able to successfully manage the risks they take and their social and emotional consequences. Sternberg and Lubart (1991) described in their investment theory of creativity that creators follow the principle of

buying low and selling high in the market of ideas. That is, creative individuals tend to pursue goals that are uncommon in their field (relatively cheap), but have potential to be developed and transformed to be attractive to the field (and sold for great gain). In addition to potential work-related losses and gains, pursuing unconventional goals exposes a person to risk of criticism or other negative social consequences because they deviate from others' expectations (Stoycheva & Lubart, 2001). Conventional goals are psychologically safer for the individual; while they do not offer great rewards, they are also unlikely to result in criticism and damaged reputation.

Concerns about social risks are associated with negative emotions (anxiety triggered by anticipated negative social consequences of risky ideas) and avoidance behavior ("better be safe than sorry"). This is especially true in evaluation situations. Both children and adults who believed that they were being observed and evaluated by outside judges tended to produce less creative collages and poems than those under no-evaluation conditions (Amabile, 1996). Pfeffer and Sutton (2000) identified perceived threat to one's safety or status as a major cause of the "knowledge–doing gap" in organizations because it prevents sharing and acting on original ideas. Similarly, Dewett (2007) found that risk-taking in R&D personnel is related to intrinsic motivation and supervisor-rated creativity.

Self-regulation of ambitious goals can create states that are both intrinsically rewarding and beneficial to creativity. When pursuing goals that are challenging, but also matched by high skills, people are likely to experience a flow state (Csikszentmihalyi, 1996; Csikszentmihalyi & Csikszentmihalyi, 1988). Flow is a peak-performance state characterized by a sense of effortlessness, absorption, loss of self-consciousness, immediate feedback about performance, and altered sense of time. Across domains, creative performance is associated with flow (Csikszentmihalyi, 1996; Gaggioli, Mazzoni, Milani, & Riva, 2015; Hart & Di Blasi, 2013; MacDonald, Byrne, & Carlton, 2006; Zubair & Kamal, 2015). Flow is also associated with intrinsic enjoyment of an activity (Csikszentmihalyi, 1996; Nakamura & Csikszentmihalyi, 2009), which in turn increases the likelihood of sustained goal pursuit (Amabile, 1996; Amabile & Fisher, 2009).

Finally, managing ambitious goals occasionally requires disengaging from goals, in the form of withdrawing effort and commitment to goals (Wrosch, Scheier, Carver, & Schulz, 2003). The ability to disengage from goals is important for two reasons. The first reason is that failing to attain a goal can reduce motivation, goal valuing, and self-efficacy beliefs (Carver & Scheier, 1990, 2002; Mischel et al., 1996). The second reason is that failing to disengage from unattainable goals can lead to missed opportunities for success in alternative goals (Masicampo & Baumeister, 2012).

SUSTAIN AND MAINTAIN

Planning and Implementation

Why is planning important for creativity? When an unfulfilled goal is activated, executive functioning, impulse control, and logical reasoning ability are diminished (Masicampo & Baumeister, 2010, 2011). Creativity heavily relies on these processes and as a consequence it is likely to be negatively affected. Planning how to address unfulfilled goals reduces the intrusiveness of goal-centered thoughts, which frees cognitive resources that are necessary for creative thinking and sustained progress toward goals (Masicampo & Baumeister, 2011).

Empirical evidence supports the role of effective planning and task organization in creativity (Osburn & Mumford, 2006) by creating conditions for long periods of enjoyable and productive effort (Kellogg, 1994). For example, writers who create outlines before beginning their work produce better manuscripts (Kellogg, 1988). One reason for the role of planning in creative work is in the limited nature of executive resources. Devoting executive resources to just one cognitively demanding task at a time—such as outlining an argument before writing—leads to better performance (Just & Buchweitz, 2014; Rubinstein, Meyer, & Evans, 2001).

Planning also involves creating implementation intentions, which help guide goal pursuit through specific if–then contingencies. Implementation intentions support initiating actions, resisting distraction, and automating responses (Bayer, Gollwitzer, & Achtziger, 2010; Gallo & Gollwitzer, 2007; Gollwitzer, 1999; Parks-Stamm, Gollwitzer, & Oettingen, 2007). By reducing the need for self-control, implementation intentions reduce the burden on cognitive resources required for creativity (Gollwitzer, 1999; Price & Yates, 2015). Thus, lack of planning can lead to slower and less successful progress on the often long road from ideas to their realization in creative products.

However, overplanning can also negatively affect creativity. Too detailed and structured plans engendered by a high need for structure can induce rigidity, which impairs creative performance (Rietzschel, De Dreu, & Nijstad, 2007). Organizational research shows that highly structured work environments (i.e., those with little flexibility in how and when tasks are completed) are associated with lower creativity (Amabile, Hadley, & Kramer, 2002; Elsbach & Hargadon, 2006). Planning and organization for creative goals is thus a balancing act between minimizing demand on cognitive resources that can be used for the creative process and rigidly scheduling tasks with specific time and resources.

Persistence in the Face of Obstacles

> Make it a point to do something every day that you don't want to do. This is the golden rule for acquiring the habit of doing your duty without pain. *Twain (1897, p. 549)*

Creative individuals persist in their work, even in the face of substantial obstacles (Helson et al., 1995). For example, Wilson (1990) found that poets persist in writing even in times of long-lasting economic deprivation and periods without critical acceptance for their work. Such persistence is possible because of (at least) two important groups of factors. First, creative individuals have a sense of efficacy and perceive success as within reach. And second, creative individuals both are intrinsically motivated for their domain of work and know how to motivate themselves for the aspects of their work that are not enjoyable.

Theories of self-regulation describe outcome expectancies and evaluations of behavior based on personal and social standards as key components in behavior control (Mischel et al., 1996). Creative individuals are rooted in both fantasy and reality (Csikszentmihalyi, 1996). They pursue ideas that take them into a world different from what currently exists while at the same time keeping in mind that creativity involves both originality and appropriateness or usefulness. To balance fantasy and reality, creative individuals need to have a strong sense of self-efficacy.

High creative self-efficacy—the belief that one is able to be successful in tasks requiring creativity—predicts teacher-rated creativity of elementary students (Beghetto, Kaufman, & Baxter, 2011), as well as creative performance in professional adults (Tierney & Farmer, 2011). Self-efficacy beliefs powerfully motivate initial goal setting and aid the ongoing process of recommitting to one's goals (Bandura & Locke, 2003). As Bandura (1997) aptly stated, "One does not find many pragmatic realists in the ranks of innovators and great achievers" (p. 74). Creative self-efficacy exerts its influence by mediating the effects of individual differences in personality, motivation, and ability on creative behavior (Choi, 2004).

When monitoring their progress, creative individuals tend to be guided by personal standards and are resistant to being swayed by judgments of others and the existing consensus (Barron & Harrington, 1981). When external standards and controls of behavior are experimentally induced, creativity is reduced (Amabile, 1996). Instead, creativity is higher when individuals are guided by self-determined reasons and important others are autonomy supportive (Sheldon, 1995). Furthermore, independence of judgment—a tendency to resist conforming to majority opinion—at age 21 predicts occupational creativity 30 years later (Helson et al., 1995). Conversely, being described by independent observers as judging in conventional ways at ages 21 and 43 is negatively related to occupational creativity at age 52.

Creative individuals often describe that they don't experience work as work-like, with all the connotations the term has in our everyday discourse: "You could say that I worked every day of my life, or with equal justice you could say that I never did any work in my life" (paraphrased from interviews with creative professionals; Csikszentmihalyi, 1999, p. 330).

Work becomes incorporated in one's identity. When an activity becomes internalized in such a way (i.e., a person who enjoys writing poetry defines himself or herself as a poet), it constitutes harmonious passion (Vallerand et al., 2003). This harmonious passion predicts creativity in the workplace measured by supervisor ratings (Liu, Chen, & Yao, 2011) and it contributes to deliberate practice, which is related to higher creativity in performing arts students rated by instructors and program directors (Vallerand et al., 2007).

But intrinsic motivation and passion do not make the daily grind enjoyable and creative individuals often have to come up with ways to motivate completion of necessary, but unpleasant everyday work tasks. Such tasks can be more immediately motivated by extrinsic rewards (e.g., getting a paper published, meeting a deadline). Extrinsic motivators exist along a continuum of autonomy, from actions stemming from complying with imposed external demands (e.g., typical homework) to, on the other end, being guided by personal values or aspirations (e.g., learning a new statistical technique in order to answer a research question) (Ryan & Deci, 2000a, 2000b). As actions are regulated in a more self-determined way, the outcomes of extrinsically motivated action are more likely to resemble intrinsically motivated behavior (Pelletier, Fortier, Vallerand, & Briere, 2001; Ryan & Deci, 2000a, 2006). Similarly, in a recent meta-analysis of 60 studies (with a total of 69 independent samples), Byron and Khazanchi (2012) found that creativity-contingent rewards reliably increased creative performance and the effect was stronger when people received positive and task-focused feedback and when they had more choice in the tasks (i.e., they were less controlled). These creativity-contingent rewards signal that creativity is valued; they facilitate the individual decision to work toward a creativity goal (what Sternberg called decision for creativity, 2006), and motivate effort throughout the task.

Managing Emotions

> When I'm in a fight I don't worry, but when things are going good I'm afraid that something's going to crack under me any minute. You may not realize it when it happens, but a kick in the teeth may be the best thing in the world for you. **Walt Disney (Miller, 1957, p. 89)**

Although a recent meta-analysis found a reliable creativity-enhancing effect of positive activated moods on creative idea generation (Baas et al., 2008), the short-term nature of this effect leads the authors to conclude that "to make a difference in creative performance, manipulating mood states is not very effective and is unlikely to produce clear and visible changes in creativity" (p. 796). Indeed, the creative process is filled with multitude of emotions, which influence creative outcomes in sometimes nonintuitive ways (e.g., described by Disney). Facing empty

computer screens or canvasses can engender anxiety and it can also be exciting. Creators across domains describe their initial ideas as relatively vague and frustration can arise at the inability to adequately represent these ideas (Glăveanu et al., 2013). Inspiration is joyful or even ecstatic. Daily doing, undoing, and reworking toward the final creative product are often painful or full of anguish (Glăveanu et al., 2013). We argue that understanding how people regulate emotions during the creative process is at least as important for understanding creativity as understanding what emotion states are beneficial or detrimental to particular creative tasks.

One reason for this assertion is based on theoretical descriptions of the nature of emotion. Emotion regulation is a major component of emotion experience (Mayer & Salovey, 1995) and some argue that it cannot be distinguished from the experience of emotion itself (Kappas, 2011). Another reason for our assertion is based on the nature of the self as agentic (Bandura, 1999). By stressing emotion regulation, we ask not only what emotion happens to be experienced (or is thrust onto an individual) but also how individuals influence the course of their emotions and change or manage emotions to reach their various goals (e.g., creativity).

Emotion regulation involves monitoring, influencing, changing, and using emotions toward one's goals (Gross, 2008). Emotions can be managed for a host of goals, from proactively preventing or minimizing undesired emotions (e.g., stage fright) to maintaining emotions beneficial for a task at hand (e.g., low activation and slightly negative emotions when having to proofread a paper or identify mistakes in computer code), to generating emotions or increasing the intensity of emotions (e.g., creating excitement when facing a brainstorming task). Being able to effectively manage emotions requires a broad repertoire of strategies that can influence cognitive, physiological, or behavioral aspects of emotions (Brackett, Rivers, & Salovey, 2011). For example, if not managed, frustration in the face of obstacles can result in disengagement. Managing emotions is important in social aspects of creativity as well, such as when leaders strategically share positive emotions to motivate creativity and to encourage persistence toward goals (Côte and Hideg, 2011; Vallerand et al., 2003) or when managing work in spite of negative and angry feedback (Van Kleef, Anastasopoulou, &Nijstad, 2010).

Hoffmann and Russ (2012) found that elementary school children described as successfully managing their emotions showed greater creativity, measured by both their performance on divergent thinking tests and observations of their pretend play. Parke, Seo, and Sherf (2015) found that emotion regulation ability increased experience of positive emotions, which in turn contributed to creativity across a wide range of jobs. Ivcevic and Brackett (2015) identified another mechanism through which

emotion regulation aids creativity. Among those with high creative potential (i.e., personality predisposition toward creativity), emotion regulation ability increased persistence in the face of obstacles and passion for one's interests.

Importantly, people don't aim only to make emotions more positive. Cohen and Andrade (2004) showed that people manage their emotions so that they benefit the tasks they face. Participants were told that they would be performing either a task requiring precise analytical thinking or a task generating creative and imaginative ideas. Then, they were given a choice to listen to happy or sad music, as a common way to create more positive or negative moods. People tended to choose upbeat music when they expected to work on a brainstorming task and sad music when they expected to work on an analytical task, thus deliberately putting themselves into the mood that can facilitate performance on particular tasks. Some people made their mood more negative because these moods are helpful for critical thinking, while others made their mood more positive because upbeat moods help original thinking.

SUMMARY AND CONCLUSIONS

Decades of research have demonstrated that personality traits such as openness to experience and cognitive abilities such as fluid intelligence and divergent thinking are crucial descriptors of creative potential. However, the process of turning creative ideas into creative products or achievements has received comparatively less attention. Although self-regulation has been an active area of research in psychology at large (e.g., Bandura, 1991; Deci & Ryan, 2000; Mischel et al., 1996; Oettingen, Hönig, & Gollwitzer, 2000), scholars have not examined self-regulation in relation to creative goals. This chapter is an attempt to address this gap in our understanding of creativity.

We adapted existing theories of self-regulation to the specific case of creative goals and proposed a two-part model: (1) revising and restrategizing; and (2) sustaining and maintaining processes. We argued that the pursuit of creative goals involves steps—problem identification, idea generation, elaboration or idea development, idea evaluation, and implementation with revision of ideas—that social psychological models of self-regulation cannot easily accommodate. The fundamentally ill-defined nature of creative goals requires continual problem exploration and redefinition from the initial idea to the creative product, and the often long-lasting process of creation requires sustaining and maintaining interest and effort in work.

What could or should be the next steps in the nascent area of research into self-regulation for creativity? We propose that the first steps

should include development of assessment tools to address the process of self-regulation for creativity. Recent empirical and theoretical work on self-regulation shows that it includes two kinds of attributes and processes (Duckworth & Gross, 2014; Ivcevic & Brackett, 2014): (1) trait-like typical behavioral tendencies, which can be assessed with self-report instruments; and (2) ability-like maximal performance, which can be assessed with performance-based instruments. Such measures need to be evaluated to establish content validity (in relation to theoretical and empirical descriptions of the creative process), convergent validity (in relation to other measures of self-regulation and motivation), and discriminant validity (in relation to measures of creative potential and general self-regulation measures). Finally, research will have to examine potential differences among domains of creative work.

This area of research can also benefit from innovative methods. Experience sampling and diary methods (Csikszentmihalyi & Larson, 1987; Hektner, Schmidt, & Csikszentmihalyi, 2006; Scollon, Prieto, & Diener, 2009) have been successfully used by creativity scholars to examine the role of emotions in creativity (Conner & Silvia, 2015; Silvia, Beaty, Nusbaum, Eddington, & Kwapil, 2014) and can be adapted to examine self-regulation in the creative process. Similarly, recent research demonstrates that the expenditure of mental effort in the process of self-regulation can be assessed using psychophysiological variables such as heart-rate variability (Geisler & Kubiak, 2009; Reynard, Gevirtz, Berlow, Brown, & Boutelle, 2011; Segerstrom & Nes, 2007; Silvia, 2015), and such measures have been successfully used in relation to creative thinking (Silvia et al., 2014). These measures can be adapted for examining self-regulation processes through prolonged periods of time.

In a way of conclusion, we would like to cite the great painter Vincent Van Gogh. He vividly describes obstacles toward achieving creative work and the process of overcoming these challenges. The following is an eloquent case for the study of self-regulation for creativity from one of the most eminent artists of the 20th century:

> What is drawing? How does one get there? It's working one's way through an invisible iron wall that seems to stand between what one feels and what one can do. How can one get through that wall? — since hammering on it doesn't help at all. In my view, one must undermine the wall and grind through it slowly and patiently. And behold, how can one remain dedicated to such a task without allowing oneself to be lured from it or distracted, unless one reflects and organizes one's life according to principles? *Van Gogh (1882)*

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Creative Mindsets: Prospects and Challenges

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How do people define creativity and do they perceive themselves as creative individuals? These are the founding questions of this very volume. We feel, however, that investigations into the nature of creative self-concept (CSC), creative self-efficacy, or creative metacognition cannot be fully grasped without an in-depth analysis of the phenomena known as creative mindsets. We define creative mindsets as people's implicit theories referring to the perceived source and nature of creativity. Even more specifically, mindsets should be seen as a subset of implicit theories of creativity that is specifically devoted to its perceived roots.[a] Indeed, some people believe that creative skills are fixed and unchangeable; these people, called entity theorists, are likely to hold the "Big-C" perception of creativity and ascribe creativity only to a very few geniuses. Others believe that creativity is trainable and may be developed as many psychological characteristics are; these people, called incremental theorists, are more likely to engage in creativity training, perform creative activity, or engage in creative hobbies. Following seminal works conducted in Carol Dweck's lab (e.g., Dweck, 2006; Yeager & Dweck, 2012), psychologists, educators, teachers, and parents began to believe that fixed mindset is dysfunctional or even harmful for human functioning, whereas growth mindset allows creative endeavor to flourish. But is it really the case? Does it apply to creativity as well? Or, to make it even more complicated, can people hold both mindsets at the very same time? These questions, among others, form building blocks for our endeavors here.

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[a]Thus, the meaning of creative mindsets we analyze in this chapter is different from creative mindset treated as a specific state of the mind that allows people to be more creative (see, e.g., Gino & Ariely, 2012; Sassenberg & Moskowitz, 2005).

In this chapter, we explore several issues related to the current state of the art in creative mindsets research and suggest a number of new research directions. The main questions we focus on relate to the importance of mindsets for creativity researchers, the conceptual relationship between mindsets and other creative self-beliefs discussed across this book, the exact number of mindsets and characteristics of people who hold neither or both mindsets, and, last but not least, conditions and consequences of mindsets and their several correlates identified in previous research. We do not aspire to present a comprehensive review of previous works; our aim is to briefly discuss main research areas in creative mindsets research and sketch some new directions for the field to follow. The six specific questions we focus on in the subsequent part are as follows: (1) Why should we care about mindsets at all and why are they important? (2) How conceptually are mindsets located within and among other self-beliefs? (3) Is it possible to hold both creative mindsets or neither mindset? And if yes: (4) who holds both/none mindsets? (5) What shapes mindsets—what is the role of parents, teachers, or cultural influences? And finally, (6) what are the next steps in the creative mindsets research?

WHY SHOULD WE CARE ABOUT MINDSETS AT ALL?

The very first question regarding the mindsets the reader may ask is why we should care about them at all. Are they relevant theoretically and predictive empirically? Do we need these constructs in creativity literature? The first, quite natural answer may be the following: mindsets are worth studying because they are on the table; hence, they are interesting in their own rights. Indeed, creativity researchers are curious what laypeople think about creativity and how they perceive it. But obviously there are also more pragmatic reasons for engaging scholars' time and energy in studying mindsets. To put it in short, mindsets matter.

Previous research has demonstrated that whether people see creativity as possible to growth or, quite the opposite, innate, influences their effort and engagement (O'Connor, Nemeth, & Akutsu, 2013). People who do not believe that creativity may be developed quite naturally see very little sense in engaging in creative activity and developing their skills. It may have serious consequences for their leisure time, hobbies, but also for their professional decisions and functioning on a job market, which puts stronger and stronger emphasis on creativity-related skills. Mindsets may also matter when one is faced with failure while dealing with creative tasks. Previous works (devoted to intelligence rather than creative mindsets) discovered that people who are incremental theorists deal better with failure, as they perceive it as an opportunity to learn (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). For people with

more fixed beliefs, failure is considered a threat and consequently even the risk of failure demotivates them to undertake the activity (Haimovitz, Wormington, & Corpus, 2011). Therefore, people holding growth mindsets are expected to engage more intensively in various creative tasks, whereas there are good reasons to believe that people with fixed mindsets will rather tend to avoid tasks perceived as complex and difficult. What is equally as interesting, because incremental theorists (so people holding high growth mindset) have more opportunities to deal with various tasks than fixed theorists, is that the former are expected to have better insight into their creative abilities. Hence, the level of creative metacognition (Kaufman & Beghetto, 2013) among incremental theorists is likely higher than among entity theorists. These consequences of mindsets by no means form a comprehensive list, as current studies bring more and more theoretically sound predictions and findings regarding the mindsets. We summarize many of them later. First, however, we explore the very nature of creative mindsets and focus on their measurement, structure, and number.

ARE MINDSETS SELF-BELIEFS?

How do researchers conceptualize mindsets? May mindsets be treated as part of a wider "family" of other creative self-belief variables (see Beghetto & Karwowski, this volume)? These questions should be efficiently resolved to build mindsets' nomological network and make a more productive theoretical analysis possible. In essence, mindsets are perceived and operationalized as a subset of implicit theories of creativity. As such, although mindsets are beliefs related to creativity, in a strict sense they are not *self*-beliefs. That being said, we should emphasize that they are conceptually closely related to creative self-efficacy, creative identity, CSC, and creative metacognition. Although mindsets relate to perceived sources of creativity rather than to perceived creative skills of oneself, it is hardly conceivable (yet still possible) that someone will hold a strong creative self-efficacy having a fixed mindset. Thus, it could be theorized that mindsets shape self-beliefs: indeed, although such a link was previously established (Hass, Reiter-Palmon, & Katz-Buonincontro, this volume; Karwowski, 2014; Pretz & Nelson, this volume), the evidence so far is purely correlational. On the other hand, however, self-beliefs may form a basis for mindset development and change as well. After all, mindsets are not carved in stone and should not be treated as traits—they are malleable (even if we are dealing with a fixed mindset); they evolve and change under a variety of influences. We discuss some unpublished findings on age-related changes in mindsets later; right now we should point out that changes in creative self-beliefs (e.g., self-efficacy that grows as

a result of mastery experiences and positive feedback from others) may influence mindsets as well. Indeed, an unpublished longitudinal study [Karwowski, M. (2016). *How mindsets change with age: Cross sectional and cross-sequential investigations.* Unpublished manuscript] provides some evidence for such a cross-lagged, reciprocal relationship. Therefore, the conceptual distance between mindsets and creative self-beliefs is slight. On the other hand, however, although different measures of creative self-beliefs tend to correlate with each other quite robustly, correlations observed between self-beliefs and mindsets are usually more variable. Using a structural equation model, Karwowski (2014) demonstrated quite a strong ($\beta = 0.55$) link between growth mindset and CSC, but interestingly, fixed mindset was also related positively to CSC ($\beta = 0.25$). The latter relationship, however, looks vaguer. In a recent study (Hass et al., this volume), fixed mindset correlated negatively with self-assessed everyday creativity measured by Kaufman's Domain of Creativity Scale (K-DOCS; Kaufman, 2012; see also McKay, Karwowski, & Kaufman, 2016) and the strength of this relationship varied across groups of students from different majors. Similarly, Pretz and Nelson (this volume) have demonstrated that although fixed mindset is virtually unrelated to creative self-efficacy ($r = -0.04$), it correlates robustly and negatively with creative personal identity (CPI; $r = -0.30$). Hence, growth mindset tends to link positively with the main CSC variables, while the relationship between fixed mindset and these constructs warrants future studies. These investigations should put more attention on fixed mindsets in order to establish the nomological network of this construct, and show its correlates, antecedents, and consequences. Very likely, however, the first question that comes to mind in the discussion about mindsets is whether fixed and growth mindsets are ends of the same continuum or whether it is possible to hold both mindsets at the same time.

HOW MANY MINDSETS AND WHY ARE TWO POSSIBLE?

If creativity is perceived as changeable, it should not be perceived as fixed: this simple logic suggests that growth and fixed mindsets form two ends of a single continuum. But is it really the case? Even in studies on implicit theories of intelligence, with mindsets treated as opposites, there is a possibility that people can hold both of them. As Dweck, Chiu, and Hong (1995b, pp. 323–324) noted:

> … we think that it is perfectly possible for an individual to hold both theories. […] This possibility—that many people actually hold both theories, albeit to differing degrees—raises many other intriguing possibilities and suggests that research

into the circumstances that might elicit the different theories may well be in a fruitful direction.

In these empirical studies on creative mindsets that used the recently developed Creative Mindsets Scale (CMS; Karwowski, 2014)—a 10-item scale with 5 items worded as accepting more fixed mindset orientation and 5 items being related more to growth mindsets—a consequently obtained solution indicates a 2-factor rather than a 1-factor solution. To put it differently, several published and unpublished studies that utilized this instrument lead to a conclusion that people tend to have two mindsets that are negatively associated. However, it is important to note that these negative links are modest. Hence, it is indeed possible to have both mindsets, as well as to have neither mindset nor a combination of fixed and growth.

Several independent studies on samples from at least eight countries (Poland, China, Mexico, the United Kingdom, the USA, Germany, Latvia, Spain) showed that the two-factor model describes data better than the one-factor model, so fixed and growth mindsets should be treated as independent (albeit negatively linked) rather than being opposite ends of the one continuum. There is, however, a potential risk that the two-factor solution obtained so far is also biased and higher-order, one-factor solution is even better fitted. To explore this possibility, we aggregated data from Polish studies that used the CMS. In total, 3123 Polish adults (age range 18–90) filled the CMS together with other measures, or separately. We fit several confirmatory factor analysis (CFA) models and exploratory factor analysis models in the structural equation modeling (ESEM) scheme, starting from one-factor models, two-factor models, and bifactor models [Karwowski, M. (2016). *Exploring the structure of creative mindsets*. Unpublished manuscript].

Although comparing the fit of several models may look like a psychometric exercise, we did expect that it could also shed some light on the structure of perceived mindsets. If two-factor models (in either the CFA or the ESEM scheme) fit better (or equally as well) than bifactor models assuming the existence of "metafactor" of mindsets, it would form a convincing rationale that people are able to separate fixed and growth mindsets and quite spontaneously do that. If, however, one-factor or bifactor solution fits better, we would have an argument that in reality people have either fixed or growth mindset. Although ESEM models fitted better than CFA models, due to their more liberal assumptions (the possibility of items to load different factors), two-factor solutions in both cases were in general the preferred ones (i.e., were characterized by comparable or even better fit than the bifactor models). Hence, we do have an argument that people are indeed able to perceive creativity as possible to be changed and stable at the same time. But how is this possible?

There are two plausible hypotheses, at least partially confirmed by previous research, but still requiring further investigations, which may stand behind this "two-mindset phenomenon." The first may be described as *the expertise hypothesis*, and the second as *the complexity hypothesis*. The expertise hypothesis relates to competencies and experience of the person, while the complexity hypothesis deals with the perceived characteristic of creativity as perceived by the person. Therefore, these two hypotheses are not mutually exclusive; quite the opposite: postulated mechanisms highlighted by these hypotheses may be quite closely linked and interrelated. Let us briefly discuss them.

According to the expertise hypothesis, the possibility of holding two mindsets at the same time may be related to richer knowledge regarding creativity (cognitive component), expertise related to creative domains (behavioral component), as well as emotional engagement (emotional component) in creative activity and creative achievement. People who have more experience with creativity, be it studying creativity-related phenomena or practicing creative activity themselves, are more likely to be aware about the existence of different creative pathways and various aspects of creativity. In the same vein, we expect that people who value creativity more and treat it as an important aspect of their identity may be more prone to accept its complicated nature and see it as both fixed and growth. This line of reasoning was already proposed (Karwowski, 2014), but to our knowledge it has not been tested yet. Using a large sample (N = 922) of participants from one of previous studies (Karwowski, 2014), that is, those who filled CMS and a Short Scale of Creative Self (SSCS), a measure of CPI (Karwowski, 2012; Karwowski, Lebuda, Wisniewska, & Gralewski, 2013), we divided all participants into five groups according to the intensity of their mindsets. The first group was characterized by a low fixed and low growth mindset (both at least −1 SD below the mean). The second group was characterized by a high fixed mindset (+1 SD above the mean) and low growth mindset (−1 SD below the mean). The third group held a low fixed mindset (−1 SD below the mean) and high growth mindset (+1 SD above the mean), whereas the fourth group was characterized by a high fixed and high growth mindset (both +1 SD above the mean). All other participants formed the fifth group. We then compared the distribution of individuals both low and high in terms of their CPI (Fig. 21.1).

The distribution obtained deviated significantly from those expected based on the random distribution [χ^2 (df = 4, N = 922) = 18.90; P = 0.001]. A vast majority of participants whose both fixed and growth mindsets were low were also characterized by low CPI. Among those whose fixed and growth mindsets were high, the ones with a high CPI predominated. Ergo, as expected, individuals with no creative mindset—with low growth and low fixed mindsets—were the ones for whom creativity was unimportant in their self-definition. Thus, it is very likely that they simply did not care
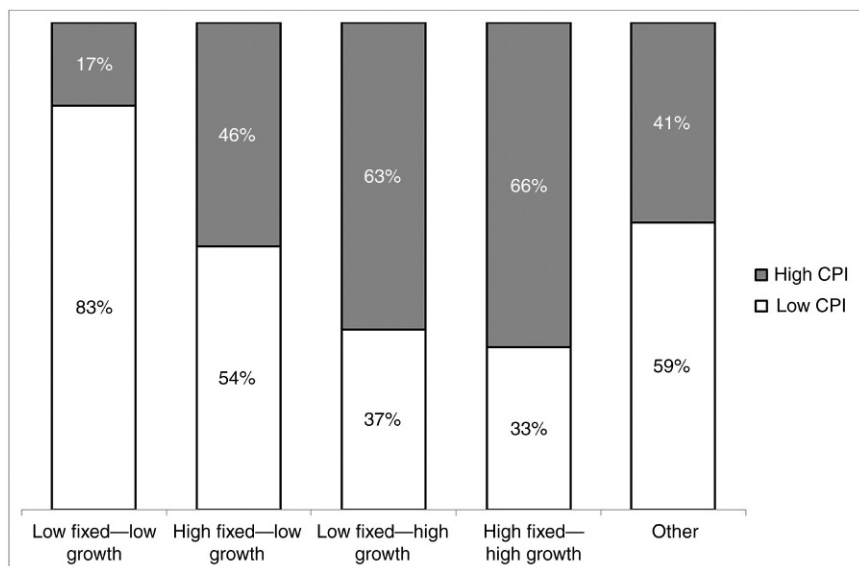
FIGURE 21.1   **Distribution of individuals with low and high creative personal identity among the different profiles of fixed and growth mindsets.** *CPI*, Creative personal identity.

what creativity is. Quite the opposite was observed among individuals who hold both mindsets at a high level—a vast majority of them were characterized by a high CPI. We used CPI as a proxy of the importance of creativity for an individual (Plucker & Makel, 2010) hypothesizing that its role should also be visible in terms of the creative mindsets typical of such individuals. People who valued creativity and described themselves as creative held a reliably higher growth mindset, although they also perceived creativity as being stable (fixed). This finding sheds some light on mechanisms that stand behind both mindsets and allows us to better explain the ability to hold two mindsets simultaneously. Further research should explore other variables associated with both mindsets.

The complexity hypothesis focuses more on the very nature of creativity rather than individual characteristics. It goes without saying that creativity is a complex phenomenon. Creativity scholars still debate on its most appropriate definition (Corazza, 2016; Kharkhurin, 2014; Runco & Jaeger, 2012; Simonton, 2012), propose different frameworks of analysis, for example, five A's (Glăveanu, 2013) instead of classic four P's (Rhodes, 1961), highlight characteristics of different levels of creativity (Kaufman & Beghetto, 2009), its different styles and forms (Karwowski, 2017; Karwowski & Jankowska, 2017; Kozbelt, 2008; Kozbelt, Beghetto, & Runco, 2010), and finally discuss the domain specificity/generality controversy (Baer, 1998; Kaufman, Glăveanu, & Baer, 2017; Plucker, 1998) behind it. Keeping in mind all these different ways creativity is understood and

studied, it is not surprising that individuals may simultaneously hold both mindsets depending on their focus on a specific aspect or understanding of creativity. It is easy to consider that a person believes that creative abilities, such as divergent thinking or imagination, may be effectively supported by training and activity (Scott, Leritz, & Mumford, 2004), but simultaneously realized that creative potential can be developed without Nobel Prize–level achievement.[b] Different studies have shown that even laypeople are quite effective in spontaneously recognizing different levels of creativity—not only little-c versus Big-C (Karwowski, 2009) but also mini-c and Pro-C (Kaufman & Beghetto, 2013; Puente-Diaz, Maier, Brem, & Cavazos-Arroyo, 2016). Going further, we expect that people who have a better understanding of the complexity of creativity are more likely to hold both mindsets. Similarly, an intriguing research problem stems from the question about the perceived role of creativity domains for mindsets' structure. As there is a clear art bias in defining and perceiving creativity (Cropley, 2014; Glăveanu, 2014) and several domains of human functioning may be perceived as less creative, the two-factor mindset structure may depend on the salience of the art bias or on linking creativity with one specific domain. Therefore, we do believe that future studies should pay more attention to the role of the level and domain of creativity and analyze mindsets related to creativity within different domains and on different levels.

Of course, the expertise and complexity hypotheses are not the only conceivable explanations of mindsets' structure. It is probable that the possibility to hold both mindsets is related to certain psychological characteristics, for example, personality, creative self-efficacy, or creative abilities. We focus on this issue in the next section.

SO WHO HOLDS NONE OR BOTH MINDSETS?

Our previous analyses suggested that holding both mindsets may be more typical for people who value creativity more—that is, those with high CPI. But what is the size of the group that holds both mindsets and how do these people differ in terms of their characteristics? To explore these questions, we reanalyzed a large dataset ($N > 1000$) from a previously published study (Karwowski, 2014) and exploited growth and fixed mindsets as factors in hierarchical clustering, using Ward's (1963) method. A dendrogram demonstrated the existence of two higher-order groups (clusters): members of the first and larger one (64%) were more oriented toward growth than fixed mindset ($M = 3.80$, $SD = 0.62$ and

[b]Recent (2016) Nobel Prize in literature awarded to Bob Dylan may be treated as a sign that the distance between more mundane and eminent forms of creativity decreases.

$M = 2.68$, $SD = 0.56$, respectively, $t[756] = 35.54$, $P < 0.001$, $d = 1.29$, 95% CI: 1.20–1.39), whereas the second group (36%) was oriented more toward fixed than growth mindset ($M = 3.94$, $SD = 0.37$ and $M = 3.61$, $SD = 0.65$, respectively, $t[433] = 9.96$, $P < 0.001$, $d = 0.48$, 95% CI: 0.38–0.58). Both groups, however, were composed of the lower-order clusters, and in the end, the five-cluster solution was chosen. Their profiles in terms of growth and fixed mindsets were clearly different.

The largest group, cluster 1, was composed of 41.3% of the participants. This group may be described as "average." Although there was significantly higher growth than fixed mindset here ($t[df = 491] = -38.84$; $P < 0.001$; Cohen's $d = 1.75$, 95% CI: 1.61–1.89), the intensity of both mindsets was medium. Thus, members of this group are quite average in terms of their acceptance of both growth and fixed mindsets. Cluster 2 (17%) was composed of entity theorists, that is, individuals with clearly higher fixed than growth mindset ($t[df = 199] = 22.00$, $P < 0.001$). The effect size of this difference was also large (Cohen's $d = 1.56$, 95% CI: 1.35–1.76). The third cluster was formed of incremental theorists—individuals with a very large and highly reliable difference between fixed and growth mindsets ($t[df = 233] = -59.99$; $P < 0.001$; $d = 3.92$, 95% CI: 3.54–4.30). The fourth cluster was characterized by the lowest level of both growth and fixed mindsets, and there were no differences between the mindsets ($t[df = 30] = 1.13$; $P = 0.27$). The last, fifth, cluster was characterized by a very high level in both mindsets. Although the difference between growth and fixed mindsets was significant ($t[df = 233] = -5.80$; $P < 0.001$), the effect size of the difference was low ($d = 0.38$, 95% CI: 0.25–0.51). Consequently, those individuals formed the most interesting group from the perspective of our discussion—almost one-fifth of all participants clearly held both mindsets.

Individuals with no mindset (or rather with the "I don't care" mindset) were clearly different from the remaining four clusters. This "no mindset group" was mainly composed of more poorly educated men who more frequently lived in villages and small towns. In the case of the Big Five personality traits, reliable differences were observed only in the case of openness to experience ($P = 0.02$). CSC variables (tCSE[c] and CPI) reliably differed between groups (both $P < 0.001$), just like effectiveness in solving insight problems ($P < 0.001$). "No mindset" group was clearly less open, characterized by low CSC, and weak in solving insight problems. On the other hand, the "both mindsets" cluster was moderately open, but high

[c]Following a recent recommendation (Beghetto & Karwowski, this volume), we reserve the term "creative self-efficacy" to task-and-situation–specific state-like rather than trait-like self-beliefs. Therefore, we use the acronym tCSE to distinguish it from the more state-like CSE. tCSE can also stand for a "traditionally" measured creative self-efficacy (see Beghetto & Karwowski, this volume).

in creative self-efficacy and CPI, although poor in solving insight problems. Incremental theorists (cluster 3: high growth, low fixed) were open and high in terms of CSC and effectiveness in solving insight problems. Entity theorists (cluster 2: high fixed, low growth) and average theorists (cluster 1: average growth and fixed) were quite similar in their profiles: their openness and effectiveness of solving insight problems was moderate, while CSC was slightly below average.

Although the mentioned reanalysis requires replication with the use of different samples and methods (e.g., latent class analyses), it shows that the group that holds both mindsets not only exists but is also quite large—almost one-fifth of all participants believed that creativity may be both malleable and stable. These individuals were also convinced about their creative abilities (high trait-like creative self-efficacy) and valued creativity (high CPI), even though they dealt poorly with tasks that require insight. Although it suggests that they are poor in creative metacognition (i.e., overestimate their abilities), such a conclusion would be premature. This profile, however, forms a convincing point for further research. As we discuss later on in this chapter, there are reasons to expect that mindsets should influence the accuracy of self-assessment, and future researchers may want to analyze the gap between perceived and actual creativity among individuals with different profiles of mindsets. Before we get back to this point, first we focus on the factors that may possibly shape mindsets.

WHAT SHAPES MINDSETS AND HOW THEY CHANGE OVER TIME?

The question how and under what influences creative mindsets develop is intriguing, yet understudied. In the subsequent part, we briefly review a number of possible sources of creative mindsets, including the role played by culture, teachers and parents, as well as an individual's own activity.

A recent line of studies analyzed cross-cultural differences in the intensity of creative mindsets (Karwowski & Tang, 2016; Tang, Werner, & Karwowski, 2016) and the potential role that may be played by individualistic and collectivistic cultural orientations. Previous studies demonstrated that thinking in terms of innate traits is much more prevalent in the West, while people from the East attribute successes or failures to effort and contextual factors rather than an individual's characteristics. Indeed, a large body of research showed that individuals from different cultures exhibit preferences of dispositional or situational explanations for behavior, that is, correspondence bias (e.g., Kitayama, Duffy, Kawamura, & Larsen, 2003; Masuda & Nisbett, 2001; Miyamoto & Kitayama, 2002; Morris

& Peng, 1994). Also, the fundamental attribution error, that is, a tendency to ignore contextual information while judging a person and instead focusing on traits, was found to be clearly stronger among American than among Asian people (Miyamoto & Kitayama, 2002; Morris & Peng, 1994). Following this rationale, Tang et al. (2016) compared the level of creative mindsets among Polish and German students (two relatively similar groups) and examined whether their cultural orientations may mediate potential differences. Tang et al. found that Polish students perceived creativity in clearly and significantly more fixed and less growth manner, but their vertical and horizontal individualism and collectivism did fully mediate these relationships. In other words, observed differences in mindsets were fully attributed to the "cultural syndromes": while horizontal cultural attitudes (i.e., orientation toward equality) translated into growth mindset, vertical orientation (i.e., a tendency toward hierarchy and competition), especially vertical individualism, clearly translated into fixed mindset. A subsequent study (Karwowski & Tang, 2016) replicated these findings on an even larger sample (almost 2000 students from 6 countries): the structural equation model showed that horizontal orientations (both individualistic and collectivist) predicted growth mindset with a robust effect size, while vertical individualism was a positive predictor of fixed mindset and negative predictor of growth mindset. In sum, both studies provide arguments that mindsets may be shaped under cultural influences, although the correlational design does not allow for a more categorical causal conclusion.

It is very likely that not only culture itself but rather the most typical and dominant parenting styles and teachers' behaviors more directly influence mindsets. Parents who prefer and often use ability-related feedback instead of more-effort or context-related messages may, usually unintentionally, build fixed mindset among their children. The very same mechanism likely applies to teachers. Previous studies demonstrated that teachers' beliefs may have quite a strong effect on students' CSC (Karwowski, Gralewski, & Szumski, 2015), especially among girls, but their potential effects on students' mindset was not studied to date. Future studies should not only explore the correlations between teachers' and students' mindsets but also apply stronger designs (i.e., cross-lagged effects or experimental designs) to test this possibility.

It may be also interesting to ask whether and how mindsets develop and change. Studies on implicit theories of intelligence and personality (see Dweck, Chiu, & Hong, 1995a, for a summary) showed that these orientations are independent from personality and intelligence, but also age or gender. These null findings seem logical—why should people's views on the nature of different psychological phenomena depend on their personality or demographics? We do not know, however, whether these null findings replicate in the case of creative mindsets. A recent investigation

[Karwowski, M. (2016). *How mindsets change with age: Cross sectional and cross-sequential investigations*. Unpublished manuscript] composed of a large cross-sectional study on a representative population (age range 18–90, $N = 809$), as well as a cross-sequential (i.e., longitudinal multicohort) study, demonstrated that indeed mindsets change, even if this effect is moderate in terms of the effect size. Interestingly, while the cross-sectional study showed relative stability of growth mindset and a significant linear increase of fixed mindset, the cross-sequential study suggested that growth mindset tended to decline, while fixed was quite stable. Although at the first sight this pattern may suggest that people become more rigid with age and tend to perceive creativity in more fixed ways (see also Hui et al., 2014), in fact these results may also be read as revealing a growing complexity of perceived mindsets and a tendency of older individuals to synthesize both implicit theories. As age changes are related to experience and higher likelihood of engaging into creative activity, also the awareness about the complexity of creativity may grow. Therefore, older individuals may not necessarily be "entity theorists." Instead, they may be "complexity theorists," that is, individuals are aware that creativity may have paradoxical nature—both changeable and fixed.

DISCUSSION: WHAT'S NEXT IN RESEARCH ON CREATIVE MINDSETS?

The basic human need is to see sense in one's own actions. If people believe that creativity is an innate or divine gift, either owned or not, it is hard to expect them to be creatively active. If we consider the role creativity plays in education (Beghetto & Kaufman, 2016; Gajda, Karwowski, & Beghetto, 2016), business (Brem, Puente-Diaz, & Agogue, 2016), but also in therapy, and successful aging (Hui et al., 2014), such high influence of fixed beliefs may be devastating. Indeed, still one of the most widely encountered myths is that creativity cannot be developed (Plucker, Beghetto, & Dow, 2004), a myth that if shared by teachers does effectively shrink the role creativity could play in the classroom (Gajda et al., 2016). On the other hand, however, as we tried to argue earlier, creativity is complex: not reducible to personality or cognitive traits, but also describing high-level achievement and special talents. Therefore, we do believe that in a specific case of creativity, it makes a lot of sense to think in terms of both fixed and growth mindsets. Mini-c, little-c, or even Pro-c is likely perceived as changeable; Big-C—despite the 10,000 hours' rule (Kaufman, 2013; Kaufman & Kaufman, 2007) and the obvious role of effort (Amabile, 2001)—is likely an innate, gift-based phenomenon.

Therefore, the future research avenues that arise from our review are fourfold. First, we call for and invite researchers to more complex

operationalizations and theorizing of creative mindsets. We briefly discussed the *domains × levels* matrix as a potential conceptual scaffolding for such works. It is possible, however, that even more complex matrices are needed. In the contemporary psychology of creativity, creativity is analyzed not only from the perspective of level and domain—quite often, the style of creative activity is analyzed (Karwowski, 2017). Therefore, one may be curious as to whether people perceive the sources of incremental and radical (Gilson & Madjar, 2011; Madjar, Greenberg, & Chen, 2011), adaptive and innovative (Kirton, 1976, 2004), or flexibility- versus persistence-based creativity (Nijstad, De Dreu, Rietzschel, & Baas, 2010) in the same fixed or growth way. This line of research obviously requires new methods (not necessarily questionnaire-based) and is time consuming, but it is worth undertaking, as it may not only shed some light on generality or specificity of creative mindsets but also explain the puzzling findings obtained so far.

The second line of potentially important research refers to experimental studies on mindset consequences, especially in the face of difficulties and eventual failure. Are incremental theorists more immune to failure? Do they indeed treat it as an opportunity to learn, while entity theorists only see threat in difficulties? Are entity theorists who spend less time on tasks more easily distracted in such situations? What is the role of creative self-beliefs—especially creative self-efficacy—in such difficult situations and how does self-efficacy interact with growth and fixed mindsets in such cases? This is the obvious problem future studies may want to resolve.

Third, future studies would benefit from even wider outlined research agenda that would aim at describing mindsets' nomological network, especially (but not limited to) in relation to other self-beliefs described in this book. We know that the correlations between mindsets and well-established predictors of creativity (openness, divergent thinking, intelligence) are, at best, tiny and capricious. Still, however, we need to better understand mindset antecedents and consequences. For example, a recent "creative mortification" model (Beghetto, 2014; Beghetto & Dilley, 2016) showed intriguing possibilities of the role played by fixed mindset for killing the enthusiasm for creative actions. Beghetto (2014) demonstrated that creative mortification, that is, loss of interest in engaging and pursuing creative actions, is strongly predicted by fixed mindset, but the author also theorized (Beghetto & Dilley, 2016) that fixed mindset may play a special, mediating role for creative mortification. More specifically, if attributed internally by entity theorists, negative performance outcome (i.e., failure or difficulty that cannot be overcome) may lead to negative feelings and affect (mainly shame) and consequently to loss of interest in creative activity. Beghetto, however, seems to treat the fixed-growth distinction as two ends of the very same continuum, and although his model seems plausible, the open question is how two mindsets discussed in this chapter relate to creative engagement. This question awaits future studies as well.

Fourth and finally, with more research and more convincing hypotheses that describe the mechanisms of how both mindsets work, creativity scholars may consider useful the works on interventions programs devoted to developing mindsets—likely: growth mindset. As both mindsets are malleable (yes, fixed mindset as well) and develop under the influence of several social factors, we believe that they may be quite effectively modeled and changed. Such mindsets-changing-programming may include a mix of different activities, including knowledge-based (e.g., results that show how effective creativity programs are: Scott et al., 2004), models-based lectures (e.g., biographies of eminent and prolific individuals who were perceived as disabled but succeed thanks to their persistence), and person-centered, creative exercises presented together with feedback stressing the observed growth. At first, however, scholars need to better understand creative mindsets: their structure, correlates, causes, and consequences. As this area of research is indeed fascinating, we do believe that the next decade will enormously enrich our understanding of these phenomena.

Acknowledgment

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THE CREATIVE SELF

Effect of Beliefs, Self-Efficacy, Mindset, and Identity

Edited by

Maciej Karwowski and James C. Kaufman

THE CREATIVE SELF reviews and summarizes key theories, studies, and new ideas about the role and significance self-beliefs play in one's creativity. It untangles the interrelated constructs of creative self-efficacy, creative metacognition, creative identity, and creative self-concept. It explores how and when creative self-beliefs are formed as well as how creative self-beliefs can be strengthened. Part I discusses how creativity plays a part in one's self-identity and its relationship with free will and efficacy. Part II discusses creativity present in day-to-day life across the lifespan. Part III highlights the intersection of the creative self with other variables such as mindset, domains, the brain, and individual differences. Part IV explores methodology and culture in relation to creativity. Part V, discusses additional constructs or theories that offer promise for future research on creativity.

KEY FEATURES

- Explores how beliefs about one's creativity are part of one's identity
- Investigates the development of self-beliefs about creativity
- Identifies external and personality factors influencing self-beliefs about creativity
- Incorporates worldwide research with cross-disciplinary contributors