
CREATIVITY AND INNOVATION

In Praise of Clark Kent: Creative Metacognition and the Importance of Teaching Kids When (Not) to Be Creative

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Despite creativity's many benefits and positive outcomes, there are still both explicit and implicit teacher biases against creative students. We argue that teachers do not dislike creativity but rather dislike inappropriate creativity that can come from students at poorly chosen times. After reviewing the literature on metacognition and creativity, we propose the adapted construct of creative metacognition (CMC), a combination of self-knowledge (knowing one's own creative strengths and limitations) and contextual knowledge (knowing when, where, how, and why to be creative). We end with ways that teachers can raise students' CMC.

Keywords: creative development, creativity, implicit biases, metacognition

Imagine going out on a date with Superman. He comes to your door with flowers, but his super-strength crushes the stems. You climb onto his back and hold on; with his power of flight, he does not need a car. So instead of engaging in pleasant conversation or listening to music, you spend the traveling time dodging bird waste. As you enter the restaurant, Superman tells you, "That was a bold choice to wear those undergarments." You realize that he has used his X-ray vision to invade your privacy. He coughs, and his super-breath slams you against a wall. As you struggle to get up, you realize from the unpleasant look on his face that his super-smelling ability can detect the garlic that you had with lunch. During dinner, he uses his heat vision to turn his steak from medium to well done and almost sets the restaurant on fire. When the bill arrives, his eidetic memory inspires him to argue with the waiter over a price discrepancy. By the end of the night, you decide you will never go out with him again.

In theory, dating Superman (or going bowling with him) sounds great, but in "reality," it would be a nightmare. As much as we may romanticize Superman and praise his flashy heroics, on an everyday basis it is much easier to live

with Clark Kent. There is an intense excitement and power that comes with a visit from Superman, much as occurs with a flash of creative insight. Yet both can be overwhelming in excess. Indeed, one could argue that the most amazing part of Superman's existence is his ability to bring out his superpowers only when necessary. He lives his life as Clark Kent—intelligent, thoughtful, and mild mannered—because he may already sense that a little Superman goes a long way. Indeed, most superheroes spend more time as their secret identity than in costume. For example, Bruce Wayne and Diana Prince only spend a small amount of time as Batman and Wonder Woman.

We see such restraint as a key issue that often gets overlooked in messages aimed at helping teachers nurture students' creative potential: knowing when to be creative. Although we agree that much more can (and should) be done to create opportunities for creative expression in the curriculum (see, for instance, Beghetto & Kaufman, 2010b), we also feel that one reason that teachers may resist implementing such curricula is because they may feel that the take-home message is simply that creativity is "always" important. In this article, we hope to demonstrate that there are many times when it is better to follow a well-established precedent or to act out of habit—in other words, to conform. As we hope to demonstrate, the important point is not whether students' creativity should be encouraged but rather teaching students when and in what contexts to be creative.

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We start out by presenting a brief definition of *creativity*, why creativity is important, the costs of creativity, and why teachers often focus on the costs (rather than the benefits). We then present our argument for why some level of conformity is beneficial, highlighting the importance of helping students develop creative metacognition—knowing when and in what context to be (and not to be) creative. We close by offering suggestions on what teachers can do to help ensure that they and their students reap the benefits (and minimize the costs) of creativity in the classroom.

WHAT IS CREATIVITY?

Definitions

The first thing that needs to be done is to define *creativity*. Plucker, Beghetto, and Dow (2004) analyzed 90 papers about creativity. They found that only 38% explicitly defined creativity. Given that the field has been plagued by conceptual fuzziness (both real and perceived), this number is embarrassingly small. Typically, creativity is considered to have two key components, which we will discuss here.

Imagine that Jacob decides to tell a creative story. “Once upon a time,” he says, “there was a boy.” Is this creative? Most people would say it is not; there is nothing new or different or original about his story. Indeed, such novelty is the first component of creativity. Yet suppose that Jacob acknowledges that his story may not have been creative and tries again. “Once upon a time,” he says, “the rhubarb winked at the elephant while mellifluously consuming the bagpipes.” Would this story be considered creative? Many people might say yes; no one has ever heard this story before. Creativity researchers, however, would likely point to its inappropriateness to the task at hand (the story is incoherent) and argue that anything that is not useful, relevant, or of high quality would not be creative. Most formal definitions of creativity place the *appropriate* component in as high regard as the *novelty* component (Amabile, 1996; Kaufman, 2009; Sternberg & Lubart, 1996).

Levels of Creativity

Context also plays an important role in definitions of creativity (Plucker et al., 2004) and highlights the qualitative differences in the levels of creative magnitude (Kaufman & Beghetto, 2009a). The following examples may help illustrate. Consider a child who feels that her poem is quite creative (novel and personally meaningful to her) but in the context of a school poetry contest, the panel of peer and teacher-judges rate the poem as quite ordinary. So, is the poem creative? Although the poem is not considered creative by the judges, it can still be considered creative at the subjective or *mini-c* level of creativity (Beghetto & Kaufman, 2007). The poem meets the standard criteria of creativity

(new and task appropriate), even if it is only judged as such by the child herself. Similarly, the quality or appropriateness would not be held to usual standards; a child may design a bridge to be made out of marshmallows, and this design should not necessarily be penalized for not being feasible.

Consider another child who writes a poem that his peers and teachers see as highly creative and, in turn, awards him “best poem” at the school’s literary fair. This same prize-winning poem may be viewed as trite and find nothing but rejection from national literary magazines. This level of creativity, called *little-c* creativity, is viewed as creative in the context of a school poetry contest but not in the context of more accomplished or professional poetry (Richards, 2010).

Few nonprodigious children would be found at the *Pro-c* level of creativity, which is reserved for expert-level creators who have not yet attained highly eminent status (Kaufman & Beghetto, 2009a). Pro-c poets are those who regularly publish in top magazines like *The New Yorker* and have their works anthologized in “Best of” anthologies. The fourth level of creativity, *Big-C*, is reserved for the true immortals, such as William Butler Yeats, James Baldwin, or Marianne Moore.

The Benefits of Creativity

Creativity’s importance can most readily be seen across levels of accomplishment (summarized in Table 1). In focusing on the Big-C or eminent level, creativity is a key force in progress. With further globalization and the resultant competition for goods and services, creativity in the workplace should become more and more important (Egan, 2005). Creativity has already been described as the most important economic resource of the 21st century (Florida, 2002), and it has become a key topic in industrial/organizational psychology. Indeed, many argue that creativity is essential for organizational success (Agars, Kaufman, & Locke, 2008).

There is much evidence to support this notion. Products that are seen as creative are also seen as more desirable (Horn & Salvendy, 2009). K. Lee, Rho, Kim, and Jun (2007) specifically analyzed how a Korean internet firm’s pro-creativity approach, in which employees’ creative ideas are solicited, has led to breakthrough financial success.

TABLE 1
Levels of Creative Accomplishment

<i>Level of Creativity</i>	<i>Example</i>	<i>Key Benefit</i>	<i>Proposed Frequency</i>
Mini-c	Child learning to play the guitar	Crucial element in learning	Whenever it occurs
Little-c	Guitarist for a garage band	Better mental and physical health	When appropriate to the context
Pro-c	Jonny Buckland (lead guitarist for Coldplay)	Career success	As needed
Big-C	Jimi Hendrix	Global impact	Whenever it occurs

Companies are increasingly including a chief innovation officer among their top management (Rosa, Qualls, & Fuentes, 2008). Indeed, the general idea that creativity (or innovation) is a key part of having a successful business is often assumed. There are many more papers devoted to “how” a leader or organization can be more creative than there are papers on “whether” creativity should even be targeted for improvement.

Indeed, at the Pro-c level, creative or innovative people tend to perform better in organizations. Seibert, Kraimer, and Crant (2001) found that personal innovation was directly linked to promotions, higher salaries, and career satisfaction. Engineering students who were assessed as being more creative in college were significantly more likely to engage in creative work activities and have more patent submissions 15 years later (Clapham, Cowdery, King, & Montang, 2005). Entrepreneurs who scored higher on a measure of idea generation were more likely to be successful (Ames & Runco, 2005).

At the little-c or everyday level, creativity enriches the human experience and is associated with many positive outcome variables. People who are creative or engage in creative activities are more likely to have better physical health (Stuckey & Nobel, 2010) and a higher state of general well-being (Carson, Bittner, Cameron, & Brown, 1994; Plucker et al., 2004; Richards, 2007). Creativity has been found to increase social harmony (B. J. King & Pope, 1999) and resiliency (Metzl, 2009), improve mood (Amabile, Barsade, Mueller, & Staw, 2005), and reduce personal stress (Nicol & Long, 1996).

Creativity also often leads to academic success, although the exact nature of this relationship is unclear. Some of the studies on this topic are stymied by the close relationship between creativity and intellectual abilities. Several studies have found a strong relationship between measures of creativity and intellectual ability (e.g., Preckel, Holling, & Weise, 2006; Robertson, Smeets, Lubinski, & Benbow, 2010). A recent meta-analysis of 21 studies found a lower but still significant ($r = 0.17$) correlation (Kim, 2005). Creativity typically significantly predicts academic achievement but often at a lower level than other cognitive traits such as cognitive style (Niaz, Saud de Nunez, & Ruiz de Pineda, 2000) or reasoning ability (Freund & Holling, 2008).

Altman (1999) administered a series of divergent thinking tests and accessed the participants' grade-point averages (GPAs). A composite divergent thinking score was significantly correlated to overall GPA with a bimodal distribution; creativity was most associated with grades in early courses and very advanced courses. Another study focused on the highly competitive private school Choate Rosemary Hall (Grigorenko et al., 2009). Choate students who performed well on two creativity tasks (writing and science) also had higher GPAs. The creative science task significantly predicted first-year GPA, although the creative writing task did not. Another large-scale study of creativity and academic

achievement in lower-socioeconomic status Spanish secondary students found that the relationship varied greatly by gender, academic subject, and the type of creativity measure used (Ai, 1999).

Finally, subjective or mini-c creativity (Beghetto & Kaufman, 2007) has value both in its own right and because it can serve as the genesis of higher, more objective levels of creative expression (Beghetto & Kaufman, 2007; Kaufman & Beghetto, 2009a). Pennebaker's work (Pennebaker, 1997; Pennebaker, Colder, & Sharp, 1990; Pennebaker, Kiecolt-Glaser, & Glaser, 1988) has offered evidence that some forms of mini-c, such as the creativity used in expressive writing, leads to improved physical and mental health outcomes. In addition, as we have argued elsewhere (Beghetto & Kaufman, 2009, 2010a; Kaufman & Beghetto, 2009b), mini-c insights are a key aspect of meaningful learning. Any time students make new (and, often, personally meaningful) connections, they are not only experiencing mini-c creativity but they are engaging in personally meaningful learning. Finally, mini-c insights can lead to larger C contributions—this can include everything from the results of a sixth-grade student's science experiment leading to professional scientists or growers rethinking the bait used to control pests, and even to the mini-c insight that led to the development of Velcro (see Beghetto & Kaufman, 2009, 2010a, for a discussion). We therefore feel that it is important for educators (and students) to be aware of these more subjective experiences of creative expression so that they can be recognized and encouraged in the classroom.

THE COSTS OF CREATIVITY

Although creativity has countless benefits at the personal and global level, it is not without its costs. Some costs are legitimate; others are stereotypes that lead to genuine interpersonal costs. Like most abilities, creativity can be a double-edged sword. One of the most commonly held beliefs is that creativity comes at the cost of mental health, what Plucker et al. (2004) called the *lone nut stereotype* about creativity: “The [creative person being a] strange, creative loner with a dark side” (p. 86). The actual empirical evidence for such a link is less clear.

There is an ongoing debate about whether creative people are more likely to be mentally ill. Three of the most commonly cited studies on creativity and mental illness are Andreasen (1987), Jamison (1993), and Ludwig (1995). Andreasen used structured interviews to analyze 30 creative writers, 30 matched controls, and first-degree relatives of each group. She found higher rates of illness in the writers and in the writers' relatives. Jamison's book includes an original study examining the lives of poets and arguing for higher rates of bipolar disorder. Ludwig's book-length study investigated over 1,000 eminent individuals who were the subjects of major biographies written between 1960 and

1990. He found a higher incidence of mental illness among those in artistic professions (e.g., writing, art, and theater) than in nonartistic professions (e.g., business, politics, and science). In response to such studies (and their prevalence in the literature), there is a line of scholarship specifically aimed at repudiating such work. Lindauer (1994), Rothenberg (1990, 1995), and Schlesinger (2009), among others, have extensively published their concerns about the validity of these results. Rothenberg (1990), for example, argued that Andreasen's selection of writers was biased and that the use of a single interviewer introduced too much error. Schlesinger pointed out the lack of consistent definitions and measures in the studies. Importantly, most of this research is focused on higher (or Pro-C) levels of creativity and not the little- or mini-c levels of creativity.

Moving beyond actual mental illness, however, there are numerous studies that indicate that negative personal attributes can be associated with creativity. For example, creativity has been linked to hypomania (Furnham, Batey, Anand, & Manfield, 2008; Lloyd-Evans, Batey, & Furnham, 2006), schizotypy (Abraham & Windmann, 2008; Karimi, Windmann, Güntürkan, & Abraham, 2007; Nettle, 2006), and anxiety (Silvia & Kimbrel, 2010). Within personality research, creativity has been associated with the broad facets of disagreeableness (L. A. King, Mckee Walker, & Broyles, 1996; Burch, Pavelis, Hemsley, & Corr, 2006) and the related facets of hostility (Feist, 1993, 1998) and arrogance (Silvia, Kaufman, Reiter-Palmon, & Wigert, 2011).

Beyond the possible personal costs, creativity also has tangible costs. Much of this research has been conducted on creativity in the workplace and has concluded that it is hard to be creative without an appropriate allotment of time or resources. Unsworth and Clegg (2010), for example, found that one of the key determinants of employee creativity (alongside such constructs as motivation and organizational encouragement) was having enough time allowed for a task. Amabile, Conti, Coon, Lazenby, and Herron (1996) found that having enough workplace resources (such as funds, materials, and facilities) was strongly related to creativity. Although much of the research has focused on how appropriate resources lead to higher individual creativity, the reverse finding (creativity costs time and money) is unarguably true.

Even beyond a financial perspective, creativity bears costs. Miron, Erez, and Naveh (2004) found that although creativity did lead to innovative performance, it also was associated with poor attention to detail and lower performance quality (e.g., being thorough and conscientious). Conformity, in contrast, was linked with higher performance quality. It is also worth noting that Madjar, Greenberg, and Chen (2011) found that people who were rated by supervisors as being radically creative were more likely to be personally committed to their career, whereas those rated as being more routine were more likely to be devoted to the company. In addition, creative team members in an organization were more likely to increase task conflict

and reduce how well the team followed standards (Miron-Spektor, Erez, & Naveh, 2011). Creative people are not necessarily "company" people. Staw (1995) highlighted some of these issues, concluding, "we should appreciate the few takers of this questionable deal [being creative] rather than scold the majority for its caution and common sense" (p. 166).

Implications of Costs

What are the implications of these costs? One is that even people's implicit and explicit views of creativity can differ. Mueller, Melwani, and Goncalo (2012) found that people did not have an *explicit* bias against creativity. However, actual views were more complex. They manipulated participants into high-uncertainty/uncertainty-tolerance and low-uncertainty/uncertainty-intolerance conditions. People primed to be tolerant of uncertainty showed positive implicit attitudes toward creativity. People primed to be intolerant of uncertainty, however, showed negative implicit attitudes—despite positive explicit attitudes. Such discrepancies can translate to biases against creative people. A striking study by Mueller, Goncalo, and Kamdar (2011) found that creativity is viewed as a negative trait for leaders. They found this result in two different (and equally frightening) ways. First, they studied employees at a workplace that required creative problem solving and found that creative people were viewed as not showing leadership ability; next, they found that people who were randomly told to offer creative solutions were considered to have less leadership potential.

Such negative reactions to creativity are not limited to the workplace or general populace. As we will see in the next section, teachers have conflicted and often negative views of creative students. The underlying reasons are complex and, frankly, sometimes warranted.

Why Teachers Focus on the Costs

There are costs to creativity; even if the bulk of these studies are conducted in the industrial/organization world, the basic tenets apply to education. Teachers are human; it is therefore unsurprising to find similar evidence of anticreative bias in the classroom. There are certainly studies that demonstrate that teachers feel favorably about creative students (e.g., Runco, Johnson, & Bear, 1993). However, studies that explore these issues deeply can find unsettling results (A. J. Cropley, 1992; Dawson, 1997).

Westby and Dawson (1995) found that teachers said that they liked creative students—yet when asked to define creativity, they used words such as *well-behaved* or *conforming*. When the same teachers were given adjectives that were typically used more to describe creative people, they said they disliked these types of students. Aljughaiman and Mowrer-Reynolds (2005) found a similar paradox—teachers said they like creativity but often do not understand what it

means. Several studies have also found that teachers' understandings of creativity are limited. Diakidoy and Phtiaka (2002) found that teachers associated creativity primarily with the arts. They also found that teachers did not associate knowledge as a meaningful component of creativity; Seo, Lee, and Kim (2005) found comparable results. In another study of teacher beliefs, de Souza Fleith (2000) found that although teachers did articulate how their attitudes might impact student creativity, they did not consider concepts such as self-evaluation, rewards, or intrinsic motivation. Schacter, Thum, and Zifkin (2006) observed elementary teachers over multiple lessons and found that few used teaching techniques that supported creativity.

An uncertain setting may evoke implicit bias against creative students. Why else might teachers not like creative students? Certainly, one reason is that they often do not like the accompanying classroom behavior (Aljughaiman & Mowrer-Reynolds, 2005). These negative associations have been present for decades. Torrance (1963) discussed how teachers preferred bright students to creative students because they were less impulsive, disruptive, and nonconformist. Bachtold (1974, 1976), in a survey of teachers, parents, and students, found that creativity was not considered to be important; there was a high discrepancy between creative descriptors and traits that were highly valued. All groups preferred people with a good sense of humor, consideration for others, health, and self-confidence. Scott (1999) had teachers and undergraduates rate mock profiles of creative and less-creative children. Teachers rated creative children as being more likely to engage in disruptive behavior.

This issue is not confined to the United States. Similar studies have also been conducted in Eastern cultures. Teachers and parents in America and India reported favorable views of creativity but also linked several words associated with mental illness (*emotional, impulsive*) with creativity (Runco & Johnson, 2002). Tan (2003) found that student teachers in Singapore favored students who had pleasant dispositions (such as being kind or friendly) over students who were more creative and risk-taking. Chan and Chan (1999) found that Chinese teachers associated socially undesirable traits with student creativity. They argued that in Chinese culture, nonconforming or expressive behavior could be interpreted as arrogant or rebellious; similar findings were obtained for Turkish teachers (Güncer & Oral, 1993).

Another factor may be the aforementioned resources issue. For example, Eason, Giannangelo, and Franceschini (2009) found that private-school teachers gave higher creativity ratings for their students than did public-school teachers. It is, of course, possible that private-school students are more creative; however, they interpreted the results as suggesting that private-school teachers value creativity more. Such teachers were more likely to have enough resources when compared to public-school teachers. Hong, Hartzell, and Greene (2009) studied how teacher beliefs, specifically goal orientations, impacted the instructional practices. There

were two such orientations: learning goals (wanting to learn or master tasks) and performance goals (wanting to perform better than others; Middleton & Midgely, 1997). Hong et al. (2009) found that teachers with learning goals used instructional techniques that facilitate student creativity. Teachers focused on high external performance goals (e.g., school standards) may be forced to adapt such a stance and its associated values.

It also needs to be acknowledged that creative students can be difficult and unruly. Brandau et al. (2007) found that students who were rated by teachers as being hyperactive, impulsive, and disruptive scored higher on a test of creative fluency. Kim and VanTassel-Baska (2010) found that creativity was related to behavioral problems in underachieving high-school students. L. A. King et al. (1996) found that agreeable students were less likely to have creative accomplishments. One possibility is that if teachers like creative students less, they may be more likely to discipline them; an alternate possibility is that creative students simply demonstrate more poor behavior.

The issues of poor student behavior and low resources are unquestionably real and present. However, we would argue that teachers do not specifically dislike creativity or creative students. The issue is one of balance and appropriateness.

IN PRAISE OF (SOME) CONFORMITY

Creativity has both benefits and costs. We argue that creativity is worth the personal and organizational resources— but only with the appropriate balance. One way of considering this question is via the intersection of the four C model and the potential impact of creative behavior. Is creativity needed—or even desirable—in the classroom? Context matters. At the mini-c level, creative actions are likely to only affect the creator. A sudden insight or a personal reflection is likely to only minimally disrupt class.

Other levels of creativity may have a stronger impact on other people (Kaufman & Beghetto, 2009a; Stein, 1953). Would you want a creative pilot or a creative surgeon? The answer is that it depends. We do not want a pilot trying a new water landing technique during a typical commercial flight or a surgeon improvising a new procedure to stop bleeding in a routine surgery. In such cases it is better to conform. At the same time, if a commercial flight somehow runs into trouble over water and requires a novel maneuver to safely land the plane, we want that pilot to pull out all the creative stops. Similarly, if a surgeon has tried all the standard procedures but is unable to stop the bleeding, we want our surgeon to continue to improvise until he or she finds a new way to stop our bleeding.

There is a time and place for creativity—and a relationship that is inversely proportional to the level of creative impact. We argue that time and place for creativity ranges from most anytime at the mini-c level of creative expression

to less frequently or “as needed” for the more observable levels of creative expression. Such levels of creative expression impact other people and are often not conducive to routine behaviors in established contexts and traditions. In short, the blessing and curse of creativity is that it disrupts the routine. As such, creators need to know when it is necessary to disrupt rather than conform to a routine. The relationship is not perfectly linear; as has been attributed to Owen Meredith, the Earl of Lytton, “Genius does what it must” (Knowles, 1999). If a Picasso decides that the time to paint his next masterpiece is during a funeral, then people make allowances that mere mortals may not be afforded.¹

We argue that a similar conditional argument about creative expression holds for the classroom. Many creativity researchers in education focus on the positive aspects of creativity to the near exclusion of other considerations. We are not advocating that educational research should focus on the dark side of creativity (e.g., D. H. Cropley, Kaufman, & Cropley, 2008) but, rather, that we should follow the lead of organizational researchers who recognize the complexity of the issue (e.g., Mueller et al., 2012; Staw, 1995; Unsworth & Clegg, 2010).

A central issue is the recognition that students (and teachers) need to be able to know when to be creative. In order to do so, students and teachers need to be able to learn to “read the situation”—recognizing whether the particular conditions and context are not only conducive to creative expression but also whether creative expression is necessary in this particular situation and context. This ability requires the development of creative metacognition.

CREATIVE METACOGNITION

Creative metacognition (CMC), like other forms of metacognitive knowledge, is a special form of cognition that helps people monitor and develop their creative competence. We define creative metacognition as “a combination of creative self-knowledge (knowing one’s own creative strengths and limitations, both within a domain and as a general trait) and contextual knowledge (knowing when, where, how, and why to be creative).” Our definition is consistent with previous scholars’ conceptions of metacognitive knowledge (Flavell, 1979; Pintrich, Wolters, & Baxter, 2000) that highlights how metacognition represents a combination of different but interrelated types of knowledge. Specifically, CMC includes the combination of knowledge about specific context and tasks that will help inform when, where, and why it might be beneficial to be creative; knowledge of strategies for how to be creative in particular domains and contexts; and knowledge about oneself (in order to recognize one’s creative strengths and identify areas in need of further development). Further, CMC would also encompass traits associated with metacognition such as self-reflection, self-regulation, and self-monitoring. Finally, our definition

reflects both domain-specific and domain-general perspectives on creativity (Baer & Kaufman, 2005; Plucker & Beghetto, 2004).

Several theorists (Davidson & Sternberg, 1998; Feldhusen & Goh, 1995) have argued that metacognition is connected to creative problem solving and that someone who is high in metacognitive ability should be a more creative problem solver. Feldhusen (1995) further argued that metacognition is one of the key factors related to creativity.

Although CMC plays a role during more subjective (or mini-c) forms of creative ideation (particularly with respect to the self-knowledge or awareness that one has had a creative idea, insight, or interpretation), creative metacognition takes on added importance when deciding to express one’s creativity in particular domains and contexts. At the Big-C level, we expect a high level of CMC. For example, Kozbelt’s (2007) analysis of Beethoven’s assessments of his own work indicated a high level of self-awareness. At a more basic level, even accomplished creators who experimented with many different genres and domains (such as Paul Simon or Mel Brooks) have enough self-insight to not pursue work in areas unsuited for their gifts. Lyricist/composer Stephen Sondheim may expand beyond the Broadway musical to create puzzles, games, mystery plays and screenplays, and film scores, but he has not pursued an architectural career.

Similar levels of CMC should be found at the Pro-c level as well. An architect will not waste her time building models out of soda cans to impress clients. A good actor (with a good agent) will pick roles that are both challenging and well suited for his abilities; consider the careers of Leonardo DiCaprio, Brad Pitt, or Ryan Gosling. A strong academic will be able to tell which papers are “A” level and should be sent to the strongest journals and which papers make a contribution but are more suited for a second-tier outlet. In one of the few empirical studies to look at CMC in a Pro-c (or nearly Pro-c) population, Fayena-Tawil, Kozbelt, and Sitaras (2011) studied the creative process in artists and non-artists and found that artists engaged in more metacognitive activity than did non-artists. Artists were more likely to monitor their progress; both artists and non-artists self-evaluated their work throughout. In an earlier study of the artistic creative process, Kozbelt (2008) found that artists who created work rated as more creative were more likely to rework, revise, and erase their drawings than those whose work was rated as less creative. Looking at a different domain, Zeng, Proctor, and Salvendy (2011) did a series of studies on advanced engineering and technology students that found metacognitive processing (as demonstrated by such strategies as taking multiple perspectives, conceptual combination, and interpersonal evaluation) was significantly related to creating novel products.

At the little-c and mini-c level, CMC may vary. Some basic awareness should certainly be present (a poet reading her work at a coffee shop knows to not read a geometric

proof, unless it is *avant garde* night), but everyday creators may not always be the best judges of their work. Most of the empirical work on CMC has focused on students or everyday creators. Hong, Peng, and Wu (2010) looked at the relationship between metacognition, intrinsic motivation, and creative student performance. Metacognition was not associated with more originality in homework assignments. It did, however, strongly relate to intrinsic motivation, which was tied both here and in the research literature (Amabile, 1996) to creative performance.

Other studies focused on how self-regulation and creativity are related. S. W. Lee (2011) proposed that self-talk in children (a precursor of self-reflection and self-regulation, two components of metacognition) is an important component of creative problem solving. Whitebread, Coltman, Jameson, and Lander (2009) found that child-initiated play activities increased metacognitive skills. Play is a key determinant of creativity in children (Russ & Fiorelli, 2010).

Some studies have found evidence that creative people have higher CMC. People who tend to produce more original responses are also better at rating their most original responses to a divergent thinking task (Runco & Dow, 2004; Runco & Smith, 1992). Silvia (2008) asked people to pick their best responses to a similar divergent thinking task and then examined whether they were more likely to choose responses that outside raters considered creative. Silvia (2008) found that people were able to discern their more creative responses—and that people who were more open to experience were more likely to choose accurately.

Some research on self-reported creativity can be seen as overlapping with the self-evaluation component of CMC. Park, Lee, and Hahn (2002) found self-reported creativity to significantly correlate with all scores on the Torrance Tests of Creative Thinking except for fluency, and Phillips (1973) found that self-assessments differed between high-scorers on the Torrance Tests of Creative Thinking and low-scorers (with high-scorers rating themselves as more creative). Beghetto, Kaufman, and Baxter (2011) found that elementary students' self-assessed creativity in math and science accounted for a small but significant proportion of variation in teachers' ratings of their math and science creativity. Similarly, Furnham et al. (2008) found that self-assessed creativity had significant but low correlations with divergent thinking tasks and self-reported creative activities.

There is other research, however, that indicates that this aspect of CMC does not necessarily correspond to measures less reliant on paper and pencil (or computer keyboard). J. Lee, Day, Meara, and Maxwell (2002) used three measures of creativity (verbal, pictorial, and self-report) and found little relationship among the three measures. Priest (2006) found that students' self-ratings of their musical compositions' creativity did not predict expert ratings of these same compositions. Kaufman, Evans, and Baer (2010) tested fourth graders in four domains of creativity (math, science, art, and writing) with a self-assessment and a rated creative

product. The two scores were not related in any of the four domains.

One possible way to bring clarity to CMC in everyday creativity is to focus on whether the people measured are closer to little-c or mini-c. Indeed, one of the times when low CMC can be a public detriment occurs when mini-c creative abilities are held to a little-c (or higher) standard. Consider *American Idol*. The winners and finalists are typically at the high little-c or Pro-c level. Yet many contestants are featured, including some clearly at the mini-c level. Such aspiring singers whose vocal talents do not align with their believed abilities (such as William Hung) are often held up for ridicule.²

Such performers are exemplars of the Dunning-Kruger effect (e.g., Dunning, Johnson, Ehrlinger, & Kruger, 2003; Kruger & Dunning, 1999). Just as high metacognition will lead to better creative performance, low metacognition may lead to lower creative performance. Kruger and Dunning (1999) argued that people who do poorly in intellectual (and social) realms may suffer from a double whammy—they are not only underperformers but they also have lower metacognitive abilities and therefore are unable to recognize their poor performance. CMC may therefore not only be associated with mini-c but may also be a factor in keeping creators at this level from developing.

MAXIMIZING CREATIVE BENEFITS: WHAT TEACHERS CAN DO

As we have discussed, creativity comes with costs and benefits. There is a time and place to be creative, and helping students develop their self- and contextual knowledge about creativity can go a long way in ensuring that teachers' maximize the benefits that can be gained from creativity in the classroom. Although there are a variety of things teachers can do to develop students' creative metacognition, we recommend the following as a starting point for teachers.

Help Students Develop a Broader Understanding of the Nature of Creativity

A first step in developing students' CMC is to help students' develop a broader understanding of the nature of creativity itself. When teachers and students recognize that creativity not only differs by magnitude (from mini-c individual insights to Big-C transformative innovations) but also involves a combination of novelty and task appropriateness, they will be in a better position to identify where, when, and in what ways creativity might play a role in the curriculum. For instance, teachers might help students recognize that although learning often involves creative ideation (at the mini-c level), it does not mean that mini-c ideas, insights, and interpretations will necessarily be viewed as new, meaningful, or appropriate at the (interpersonal) little-c level.

Recognize the Costs and Benefits That Creativity Can Offer

Teachers can also help develop students' metacognitive abilities by helping youngsters become more aware of the potential costs and benefits associated with creative expression. Increased awareness of the positive and negative consequences of creativity can help students decide whether to take the intellectual risks necessary to engage in and share their creative ideas, insights, and interpretations. Unless students understand both the potential benefits (e.g., developing new insights, procedures, outcomes) and potential costs (e.g., wasting one's time and effort, being laughed at, dismissed, ignored) they will not be in a position to determine whether the level of risk associated with creative expression is worth taking. Risk-taking by itself does not necessarily lead to creativity; the key is sensible risk-taking (Sternberg, Kaufman, & Grigorenko, 2008).

Help Develop Students' Self-Knowledge About Their Creative Strengths and Limitations

In addition to helping students understand the nature of creativity and its potential costs and benefits, teachers can support the development of students' CMC by providing them with continual informative feedback on their own creative strengths and limitations. The Goldilocks principle (Beghetto & Kaufman, 2007) can serve as a useful guideline for teachers—helping them keep in mind the importance of providing feedback that is not too harsh (stifling students' motivation) or not harsh enough (little attention to any semblance to real-world standards). Just as Goldilocks sought oatmeal that was neither too warm nor too cold, so should a teacher seek feedback that is neither too nice nor too mean. The goal is to provide the right level—striking a balance to provide honest feedback that is both challenging and supportive.

Help Develop Students' Contextual Knowledge About Creative Expression

Finally, teachers can support the development of students' CMC by helping them better recognize the contexts that are more (and less) conducive to creative expression. This involves not only clarifying the constraints and expectations of particular assignments, tasks, and activities but providing the rationale for expectations and constraints when creativity is (and is not) necessary (e.g., "The reason why I am asking you to follow this procedure, rather than come up with your own, is because we want to first understand how these result in the chemical reaction we have been discussing.")

CONCLUSION

What made Superman different from the legion of imitators to follow was not that when he took off his clothes

he could beat anybody—they all could do that. What made Superman extraordinary was his point of origin: Clark Kent. Remember, Kent was not Superman's true identity as Bruce Wayne was the Batman's. . . . Superman had only to wake up in the morning to be Superman. In his case, Clark Kent was the put on. (Feiffer, 1965, pp. 18–19)

Many approaches to creativity in the classroom suppose that children are Bruce Wayne and need to be given the tools for creativity. The main goal of this approach is to increase children's creativity—and we are not arguing the importance of the goal. Many children are not in touch with their inner creativity or have had it drained out of them. Enabling all children to be creative in their own way is essential—but it is only part of the process.

Children who are Bruce Wayne need to learn how to be Batman. But it is just as important for children who are Superman to learn how to be Clark Kent. We all know children who are bursting with ideas and flights of fantasy and lightning bolts of imagination. Such children can be thought to have imaginal overexcitability; in such children, "boredom is anathema; the need for novelty is absolute" (Daniels & Piechowski, 2009, p. 12). Without further shaping and directed instruction, these creative children may inadvertently be distracting and disruptive, alienating both teachers and peers. Without a strong level of CMC, such children may play into societal biases against creativity and thus limit their own potential.

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NOTES

1. Thank you to an anonymous reviewer for this last concept.
2. In this instance, it would be the interpretation of the song that could be novel and appropriate, not the song itself. Even a singer who imitates the original song could be considered creative; as Sternberg, Kaufman, and Pretz (2002) argued, a replication of a great work is still a (small) contribution in its own right.

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