

## Chapter 8

# Democratizing Creativity by Enhancing Imagery and Agency: A Review and Meta-Analysis

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*Creativity is a vital topic of various educational discourses, yet the support it receives within the school system is insufficient. This chapter focuses on four particular ways of making creativity more democratized, salient, and accessible in school settings. We start by exploring the educational benefits of egalitarian theoretical approaches to creativity. Then, we posit that democratization requires an equal focus on the cognitive aspects of creative potential and the motivational sphere of self-perception and self-regulation. Third, analyzing cognitive characteristics, we pay special attention to creative imagery: an understudied yet critical aspect of creative potential. By meta-analyzing available evidence from interventional studies, we show that there are multiple effective approaches to enhancing creative imagery, so—in a sense—supporting creative potential might be democratized as well by going beyond creativity training. Fourth, and finally, we discuss the possibilities of adapting so-called wise interventions for the educational psychology of creativity. We review available evidence of how to strengthen creative confidence and the perceived value of creativity among students, and how to make their creative self-regulation more effective.*

## INTRODUCTION

Contrary to many complaints, creativity scholars usually agree upon the definition of their central construct of interest. In short, and most generally, creativity is understood as activity that leads to outcomes that are original (novel) and relevant (appropriate, useful; Runco & Jaeger, 2012). Although additional criteria sometimes

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supplement this general definition—be it the aesthetical appeal of the outcome (Kharkhurin, 2014), indecisiveness and uncertainty of the process (Corazza, 2016), or that the obtained effect is surprising (Simonton, 2012)—there is a relative consensus that originality and relevance are the most important criteria of creativity.

In a seminal paper, Plucker and colleagues (2004) made a clear case for the importance of creativity for education. They defined creativity as “the interaction among aptitude, process, and the environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context” (p. 90). This definition highlights the importance of various building blocks of creativity and does not reduce it to highest-level, genius-like achievements. On the contrary, such a broad understanding of creativity is a vital step toward its democratization that started 70 years ago (Guilford 1950, see also Glăveanu, 2019). At the same time, however, this definition still posits that to be called creative, “the interaction” must result in observable products that are acclaimed as original and useful within the particular social context, including the context of the classroom. Hence, ideas that do not end up as observable outcomes should likely not be called creative. Although this problem could be solved by broadening the definition of the “product”—by considering any idea a product, for example—such a solution does not seem particularly convincing.

A theoretical perspective that overcomes the difficulties with product-oriented definitions is the 4C model of creativity (Kaufman & Beghetto, 2009) that distinguishes between four hierarchically organized levels of creativity. The first level is mini-c creativity, which focuses on mental processes responsible for analyzing, combining, and restructuring information. It engages creative thinking and imagination while solving problems or developing new ideas, and denotes the potential to apply creativity in learning or problem-solving. This form of creativity is fundamental in education as it constitutes the basis of creative learning (Beghetto, 2016; Karwowski, Jankowska et al., 2020; Zielińska, Lebeda, Jankowska, et al., 2021). Mini-c creativity utilizes verbal creative thinking processes (e.g., divergent thinking, analogies, and remote associations) as well as nonverbal aspects of creative imagery, or visual metaphors. In sum, mini-c creativity is a cognitive potential to generate creative ideas and solve problems, observed in everyone, albeit to a different degree. Obtaining higher levels of creativity is hardly possible if mini-c is low.

Little-c creativity denotes an activity that results in observable products. These products, however, are of personal rather than social importance. Examples include do-it-yourself gadgets and solutions, for example, creating a new gift for a friend, decorating someone's room, or solving a broken furniture problem (Zielińska, 2020). Hobbyist-like little-c not only sets the stage for more professionalized and product-oriented Pro-c and Big-C levels, but it also builds positive affect and allows people to flourish (Conner & Silvia, 2015).

Pro-c and Big-C levels apply to professionalized creativity, either in the work settings (Pro-c), or those that concern the greatest achievements of famous creators (Big-C). While these levels are usually outside the interest of education researchers, occasionally great creators are used as models to inspire children to act more

creatively. This strategy, however, should be used with caution. Presenting creativity as a trait of the most outstanding figures might unintentionally activate the so-called fixed creative mindset (Karwowski, Czerwonka, et al., 2020)—a belief that creativity is inherited and cannot be changed. Given that this is one of the most harmful myths for using creativity in education (Plucker et al., 2004; Sawyer, 2011; see also Benedek et al., 2021), using such examples should be accompanied with accentuating how creators dealt with their problems and what strategies they used, rather than presenting them as always and easily succeeding (Lin-Sieglar et al., 2016).

Based on the perspectives outlined above, it is clear that contemporary theorizing is centered around egalitarian forms of creativity. In a sense, therefore, the first step toward democratization of creativity has already been taken. Indeed, creativity is no longer limited to accomplished creators. Another way of democratizing it is to explore how schools could make creativity more accessible not only for gifted students (Winner, 1996), but for everyone (Runco, 2004). Thus, the next step in this direction could be to apply a broader operationalization of creative potential, for example, by supplementing the typically analyzed divergent thinking skills (Runco & Acar, 2012), with other forms of creativity-relevant abilities (e.g., Finke et al., 1992).

The other aspect that seems critical for making creativity more salient is motivational. Promoting creativity in general and in the classroom in particular, requires a better understanding of why people often decide not to create. Such reasons and obstacles are of a different nature, ranging from a low level of creative interests and abilities (Benedek et al., 2020), to a difficult position in social strata (Castillo-Vergara et al., 2018), to a low value ascribed to creativity in a family (Liang et al., 2021). Yet, what seems essential is the motivational sphere of self-perception (Karwowski & Kaufman, 2017). As we explain below, people often do not consider themselves sufficiently creative and, even when they start trying, they often do not know how to pursue complex tasks, persist in the face of obstacles, and communicate their ideas effectively. This is the next point we would like to make: *Democratization of creativity requires a balanced focus on cognitive and non-cognitive skills, as both make creative actions possible.*

In this chapter, we approach democratization of creativity from a perspective inspired by Creative Behavior as an Agentic Action model (CBAA; Karwowski & Beghetto, 2019). This model integrates cognitive and motivational factors as drivers of creative activity. More specifically, while the CBAA sees cognitive creative potential as a necessary condition of any activities and achievements, it also theorizes the intermediary role of two factors: creative confidence and the perceived value of creativity in the link between potential and behavior. Given the role both cognitive and motivational factors play in democratizing creativity, we decided to focus our review on the possibilities of strengthening it in and out of the classroom.

The remainder of this chapter is organized as follows. In the first part, we briefly overview the CBAA model and justify why it serves as a useful framework for democratizing creativity. In the second, we focus on the cognitive side of creative potential, emphasizing the importance of creative imagery abilities. We argue that this understudied aspect of creative cognition—if included in our interventions

and research—might result in identifying a larger and more diversified group of potentially creative students than approaches based on divergent thinking alone do. A core of the second part of this chapter is a meta-analysis that explores the effectiveness of interventions devoted to supporting creative imagery. Including differentiated interventions allows us to provide an additional perspective—one that democratizes the ways of enhancing creative abilities by going beyond creativity training, usually focused on divergent thinking (see Scott et al., 2004). In the third part, we provide a narrative review of the approaches to strengthen creative self-confidence and self-regulation. We situate this review within the intensively growing research on wise interventions conducted in educational psychology. Although wise interventions are scarce when it comes to creativity, we see them as promising and discuss select examples of how they might strengthen engagement in creative activities.

### **CREATIVITY AS A DECISION: CREATIVE BEHAVIOR AS AGENTIC ACTION MODEL**

One puzzling finding prevalent in creativity literature is that creative potential is a mediocre predictor of creative activity (Runco et al., 2010), not to mention creative achievements. Although some studies show strong links between the two (e.g., Plucker, 1999, latent correlation of  $r = .60$  after 40 years), this relationship is usually small-to-moderate (see Kim, 2008, for a meta-analytical summary of  $r = .22$ ). Thus, cognitively measured creative potential alone cannot tell us much about the likelihood of real-life creative achievement.

Is this really surprising? No, not given how complex the conditions of creative achievement are (Feist & Barron, 2003). After all, activity and achievement are not only driven by creative abilities (Kim, 2005), but also by general cognitive ability (Gerwig et al., 2021), domain-specific skills (Simonton, 2009; Szen-Ziemiańska et al., 2017), time and effort invested in training (Kaufman & Kaufman, 2007), as well as social and cultural circumstances that make creativity possible (Simonton, 1997), just to name a few critical predictors of real-life creativity (see also Lebudá et al., 2021).

Considering it as a decision to make (Sternberg, 2002) is an inspiring way of thinking about creativity. Even the highest potential is meaningless if the person does not decide to try it out or to explore the new territory. Such a decision is often risky and uncertain. This is precisely why many potentially creative people decide not to defy the crowd and prefer to take the known road. Hence, one way to make creativity more salient, accessible, and visible is to strengthen the agentic side of people's self-perception.

The CBAA model (Karwowski & Beghetto, 2019) theorizes the primary role of two elements in the journey from creative potential to creative achievement. Creative confidence comes first. Depending on the theoretical position (see Beghetto & Karwowski, 2017), creative confidence might be operationalized as a relatively stable creative self-concept (e.g., Tierney & Farmer, 2002) and fairly dynamic creative self-efficacy (Karwowski, Han, et al., 2019). Creative self-concept

is more of a trait, a generalized “I am creative” self-perception. Creative self-efficacy is more task-specific and is embedded in a particular situation (“I can” self-perception). Indeed, a student might feel that they can creatively deal with a calculus problem they have just encountered, yet not with a geometric problem at hand.

In the CBAA model, creative confidence is theorized to mediate the links between potential and behavior. Why is the mediational link posited? In short, higher creative potential makes it more plausible that the primary sources of self-efficacy will grow (Bandura, 1997). More creatively skilled individuals have bigger chances to achieve different sorts of successes (mastery experiences), meet creative models (vicarious experiences), gain social support (social persuasion), and feel less anxiety and more positive arousal while solving creative tasks (physiological experiences).

The second factor that plays a vital role in the CBAA model is the perceived value of creativity—a kind of centrality of creativity in one’s self-description. This identity-based factor is responsible for the decision to engage in creative activity in the first place. As demonstrated in a series of studies (Karwowski & Beghetto, 2019), even the most creative people tend not to fulfill their potential if they do not consider creativity important.

The CBAA model was developed based on previous theorizing in creativity literature (Sternberg 2002), but it was also inspired by prominent works in educational psychology (e.g., expectancy-value theory of motivation; Wigfield & Eccles, 2000). So far, its main predictions were supported by correlational and longitudinal studies (Karwowski & Beghetto, 2019), although there is also interventional research that seems promising as a way of developing creative activity by supporting creative self-confidence, which we discuss in more detail in the third part of this chapter (Zielińska, Lebuda, & Karwowski, in press). Notably, both creative confidence and the perceived value of creativity are elements that provide a plausible answer to the question of why creative potential is or is not translated into creative achievement. This is where the perspective the CBAA proposes might help in the democratization of creativity. It happens that people do not attempt to create because they do not perceive themselves as able to do so, and this lack of a belief is associated with their characteristics (e.g., gender [He & Wong, 2021]; social status [Karwowski, 2011]; or other factors). Being aware of that might give teachers an instrument to support students’ creative confidence (see Karwowski et al., 2015). In essence, different educational solutions could address creative potential, creative confidence, and valuing creativity. While previous attempts focused on a small part of creative potential (primarily divergent thinking and problem-solving skills) in creativity training (Scott et al., 2004), they often overlooked the remaining aspects of creative cognition and motivation.

According to the CBAA model, when people value creativity and believe that they can behave creatively, they are more likely to engage in creative activities. Moreover, if these beliefs are accompanied by their creative skills and abilities, the chances for success grow. However, there is still the vital question of how exactly this process happens. Various factors seem to moderate and mediate the relationships between potential and behavior. Consider, for example, a recent study (Beghetto et al., 2021), which

demonstrated that the links between creative confidence and creative activity, as well as achievement, are stronger among people who are higher in the trait of intellectual risk-taking. Intellectual risk-taking might therefore be among the preconditions for the successful use of an individual's potential and motivation.

Similarly, there is a reason to expect that people who are stronger in their creative self-perception will be able to plan, monitor, and assess their creative functioning more effectively, and hence be better at self-regulating their functioning (Zielińska, Lebuda, & Karwowski, in press). One reason to expect such a relationship is the lower subjective cognitive load that complex tasks induce among more creatively self-efficacious people (Redifer et al., in press). Additionally, given their confidence and experience, they might have a more pragmatic and organized approach to such problems and feel less stressed and helpless when faced with them (Zielińska et al., 2022; Zielińska, Lebuda, & Karwowski, in press).

This chapter uses the CBAA model as a theoretical framework for our explorations of how to democratize creative experiences. Our main focus is on two aspects. The first is possibilities to support creative imagery—an overlooked element of creative abilities. The second is the opportunity to strengthen creative self-beliefs and self-regulation during creative activity. In the section that follows, we provide an overview of previous literature and meta-analyze attempts to support creative imagery. Then, we narratively overview wise interventions that seem promising in supporting motivational aspects of a creative agency.

### DEMOCRATIZING COGNITION: CREATIVE IMAGERY

A fascinating observation regarding human cognition is that it is—to a large extent—visuospatial (see Shepard, 1984). As Finke (1990, p. 171) observed, based on Shepard's works (e.g., Shepard 1984), "much of human thought—particularly, creative thinking—has at its basis the mental representations of spatial structures and their relations." Still, divergent thinking has been the most often studied aspect of creative abilities since the early works of the founding fathers of contemporary creativity science, such as Joy Paul Guilford (1950) and Ellis Paul Torrance (1976). Divergent thinking is understood as "the ability to generate multiple solutions to a given stimulus or problem" (Reiter-Palmon et al., 2019, p. 144) and there are convincing reasons to consider it a cognitive marker of creative potential (Runco & Acar, 2012). At the same time, however, most measures of divergent thinking and its very operationalization makes this sort of ability highly verbal. It brings to mind the discussion covered in the giftedness literature with verbal intelligence tests being considered insufficient to identify spatially rather than verbally gifted individuals (Lohman, 2005).

Our argument inspired by this analogy is that democratizing creativity also means democratizing creative abilities. By this, we mean equal focus on divergent thinking and on the less verbally saturated aspects of creative potential. What seems to be especially promising to this end is creative imagery: an individual's ability to create, interpret, mentally transform, represent, and transcend representations based on past observations (Jankowska & Karwowski, 2020).<sup>1</sup>

The roots of research on creative imagery go back to the 19th-century classic example of Galton's (1880) "the breakfast table study" (see also Karwowski & Jankowska, 2019). More recent studies recognized the role mental images play for visual creativity (Palmiero et al., 2015) and creative thought in general (Finke et al., 1992; Ward, 1994). Past decades have also increased availability of interventions that educators can use to develop creative imagery processes (Dziedziewicz et al., 2013; Karwowski & Soszyński, 2008).

Seminal theories see creative imagery as a vital subset of creative cognition. Consider the gene-plore model of creativity (Finke et al., 1992). Studies inspired by the creative cognition approach demonstrated that imagery is essential in creating new image combinations representing original ideas and thoughts (Finke, 1990). Importantly, and consistent with our argument, creative imagery is independent of divergent thinking: A meta-analytical correlation between these two constructs is only slightly above  $r = .10$  (LeBoutillier & Marks, 2003).

Creative imagery seems to be particularly well-fitted to be discussed in the context of democratizing creative experiences for many reasons. Several studies demonstrated that contrary to other aspects of creative abilities—like divergent thinking, remote associations, or conceptual combinations—it is less dependent on general cognitive ability (Abraham et al., 2005; Jankowska & Karwowski, 2020) and verbal modes of thinking (Suler & Rizziello, 1987). Therefore, although intelligence plays a substantial role in creative thought (see Gerwig et al., 2021 for a summary), it seems to be less relevant for creative imagery (Jankowska & Karwowski, 2015). The same applies to other correlates of creativity; for example, creative imagery is weakly correlated with socioeconomic status and cultural capital (Jankowska & Karwowski, 2020). Hence, creative imagery is widely accessible and less restricted by social or economic factors. This is precisely the reason why focusing on creative imagery might make creativity more democratized.

### More Ways Than One: How to Support Creative Imagery

What makes creative imagery particularly worthwhile is the richness of approaches to develop it. From visiting science museums (Gong et al., 2020) to gamified classroom management using fictionalized programs (Chen et al., 2020), watching science-fiction films (Lin, 2014), engaging in imaginary pretend play (Thibodeau et al., 2016), or role-playing games (Karwowski & Soszyński, 2008), there are many effective ways to enhance creative imagery. One particular way to focus on creative imagery abilities is through creative imagery training—a specific subtype of creativity training. Unlike the typical creativity training, which engages various creative abilities, imagery training focuses on the cognitive stimulation of this particular set of abilities. A previous meta-analysis demonstrated imagery training results with a moderately positive effect:  $d = 0.44$  (Scott et al., 2004). This kind of training is usually carried out among preschool-aged children (Dziedziewicz, 2008) or school pupils (Gundogan & Gonen, 2013), less so among university students or adults. Such training varies significantly in its exact form and curriculum. For example, activities are



based on the creation of graphic and verbal metaphors (Limont, 1996), the use of fairy tales (Smogorzewska, 2012), or drama games (Udwin, 1983). While creative problem-solving training is based on solving real, existing problems, imagery training often addresses the more abstract issues with no specific solution.

Another common type of creative imagery enhancement is creativity training that incorporates imagery techniques that activate imaginative processes (e.g., Lopez-Martinez & Navaro-Lozanno, 2010). The main one is visualization, based on producing images of new items in mind, such as objects, characters, events, activities, or processes (Ho et al., 2013). In this case, enhancing creative imagery is one of the many goals of these activities (Garaigordobil & Berruoco, 2011; Kyung-Won, 2000) alongside divergent thinking or remote associations.

Imaginative techniques are also employed in more general educational activities; consider, for example, imagery instructions applied in creative writing workshops (Jampole et al., 1994), using puppets in pretend play interventions (Thibodeau et al., 2016), playful improvisation theater (West et al., 2017), and programming workshops (Bustillo & Garaizar, 2016). This group of interventions varies in terms of content. Many programs use fictionalization, so they are based on narratives, creating stories, or role-play (see Dziedziewicz & Karwowski, 2015) and often use a broad and overall theme that bonds the activities, be it traveling (Dziedziewicz et al., 2014), participating in detective stories (Ripple & Dacey, 1967), or presentation of a particular hero's adventures (Chen et al., 2020; Dziedziewicz et al., 2013). Imagery techniques can also form the basis for fictionalized adult-oriented activities, such as role-playing games (Karwowski & Soszyński, 2008).

While the richness of potential approaches to support creative imagery is promising, their effectiveness is largely unknown. Are we able to support students' creative imagery and related creative skills using various training, workshops, and educational activities? To answer this question, we decided to conduct a meta-analytical summary of available evidence.

## **THE PRESENT META-ANALYSIS**

The main objective of our meta-analysis was to evaluate the effectiveness of various forms of stimulation of creative imagery. We were, to a lesser extent, driven by the typical question meta-analyses usually ask (i.e., "did it work?"), instead deciding to focus on "what worked." We expected that different ways of supporting creative imagery might have robust effectiveness, thus providing multiple potential ways to support this aspect of creative abilities.

### **Literature Search and Eligibility Criteria**

We applied the following inclusion criteria while searching for the studies to be included in our synthesis: (1) the aim of the intervention had to entail enhancement of creative imagery, (2) participants' creative imagery had to be measured quantitatively, (3) the study had to be conducted using an experimental or quasi-experimental design.



The search was conducted as a four-step process. The first step included examination of titles, abstracts, and citations of articles identified in the database, based on initial pre-selection (over 17,800 articles). We used EBSCO, JSTORE, Science Direct, SAGE Journals, Taylor Francis Online, Wiley Online Library, Questia, ProQuest, and Google Books databases. The search was conducted with the following keywords: *creativ\*imagery*<sup>2</sup> OR *imagination*. These terms had to appear either in the title, abstract, or as keywords. The final decision about including or excluding followed after examining the full text of pre-selected works. In the second stage, we reviewed the studies included in previous meta-analyses (e.g., Tsai, 2014; Scott et al., 2004). The third stage was a systematic review of the following journals: *Journal of Creative Behavior* (1967-2021), *Thinking Skills and Creativity* (2006-2021), *Creativity Research Journal* (1997-2021), *Psychology of Aesthetics, Creativity, and the Arts* (2006-2021), *Creativity: Theories-Research-Applications* (2015-2021), and *Gifted Child Quarterly* (1957-2014). In the fourth step, we included unpublished master theses and doctoral dissertations available in Proquest. Finally, we also examined chapters in edited works and conference proceedings. We included mostly studies published in English ( $k = 20$ ), with a subset of studies available in Polish ( $k = 6$ ) and Spanish ( $k = 2$ )—the languages our coders were proficient in.

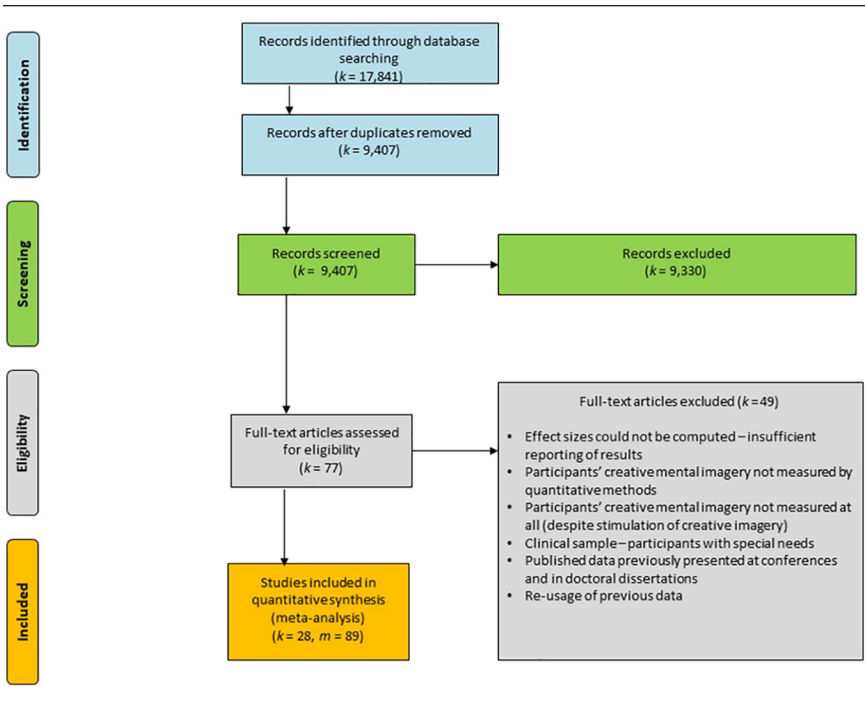
Twenty-eight studies were included in the final analysis (see Figure 1). Of those 28 studies, 20 were published in peer-reviewed academic journals, three as monographs/books, two as book chapters, and three came from unpublished doctoral dissertations. When a study with duplicated data appeared in published and unpublished work, we analyzed the data from the first work (i.e., Dziedziewicz et al., 2014 and Dziedziewicz et al., 2015; Garaigordobil & Pérez, 2002 and Garaigordobil & Pérez, 2004).

### Coding Procedure

All studies were coded for moderators (see the Moderators section) by two independent coders. The Cohen's  $\kappa$  ranged from  $\kappa = .70$  to  $\kappa = 1$ , depending on the criterion, and the consensus was reached after discussion.

Then, the second and third authors also coded all studies for the study's quality, including four aspects (see e.g., Szumski et al., 2017, for a similar approach): *conceptualization* (three detailed criteria: [1] Is a compelling case for the importance of the research made? Is the conceptualization based on well-designed studies and does it reflect the scope of extant knowledge? [2] If an innovative approach is proposed, is it based on a sound conceptualization formed from sound research? and [3] Are the research questions appropriate and stated clearly for the purposes of this study? Are valid arguments supporting the nature of intervention in the comparison group(s) presented?); *participants/sampling* (two criteria: [1] Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions [random assignment, similar classrooms, schools in comparable districts, etc.]? [2] Was sufficient information provided, given characterizing the interventionists or teachers? Did it indicate whether they were

FIGURE 1  
Selection and Exclusion Process



comparable across conditions?); *implementation of the intervention and the nature of comparison condition(s)* (three criteria: [1] Is the intervention clearly described and specified [conceptual underpinnings, instructional procedures, instructional materials, etc.]? [2] Are procedures for ensuring and assessing fidelity of implementation described [the number of days/sessions of intervention, specified amount of material, the interval time of intervention implementation, time allocated to the intervention, etc.]? [3] Are the activities conducted in control group described and documented [instruction, content, materials, etc.]; and *outcome measures and data analysis* (three criteria: [1] Is evidence of psychometric properties for the outcome measures provided? If not, will it be calculated [reliability, validity, etc.]? [2] Are the data analysis techniques appropriate and linked to key research questions and hypotheses? [3] Are data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions [developing a coding manual, training coders, double-coding, etc.]?).

In each of the 11 separate criteria, the coders assigned the studies with a score of 0 (not met) or 1 (met). Criterion-specific agreements between the two coders ranged from  $\kappa = .46$  to  $\kappa = 1$  (median  $\kappa = .73$ ), with overall agreement, aggregated across

criteria, being excellent ( $ICC = .88$ , 95% CI  $[.77, .94]$ ). Given high between-coder agreement, we averaged their overall quality scores and used this variable as a continuous moderator.

### Moderators

All studies were coded for six categorical moderators. These were: target group age (coded: children, adolescents, adults); measurement of variables of interest (only creative imagery, creative imagery and other traits/skills, e.g., creative thinking); and instrument type (coded: test, scale/questionnaire, product/interview). We also coded the intervention's main focus, with interventions that focused only on developing creative imagery (a cognitive outcome), and developed creative imagery and other characteristics (e.g., attitudes or creative thinking). Intervention form was another moderator, with four categories coded as longer-term imagery training, a short stimulation of creative imagery, creativity training involving some imagery techniques, and other interventions (e.g., museum visits). The final and essential moderator focused on the content of the intervention, with six categories: (1) dramatic play, creative movement, and music activity; (2) literary and verbal activity; (3) verbal and figural activity; (4) multi-sensory stimulation interventions; (5) fictionalization, role-playing games, and pretend play; and (6) aesthetic and perceptive stimulation (see Supplementary Table 3 in the online version of the journal, for more details about this moderator's coding).

### Statistical Procedure

Because individual effects were nested within studies, we used a multilevel meta-analysis (Konstantopoulos, 2011). This statistical technique overcomes numerous limitations that typical random-effect models could not handle, including a proper estimation of standard errors (see Cheung, 2014, for a more detailed discussion). A three-level meta-analysis was estimated using the metafor package (Viechtbauer, 2010) for R. Databases, R codes used in this meta-analysis, and detailed quality scores are available in the Open Science Framework Archive (<https://osf.io/ju9de/>).

## RESULTS

Our meta-analysis included 28 studies published between 1967 and 2020, on a total sample of 4,424 participants. Half of all investigations were conducted in Europe ( $k = 15$ ), six were from the United States ( $k = 6$ ), and the remaining ones were from Asia or the Middle East ( $k = 7$ ). The studies included in this meta-analysis used different approaches to developing creative imagery: five focused on using verbal techniques (Chiu, 2012; Jampole et al., 1994; Limont, 1996; Pavlik, 1989; Smogorzewska, 2012); four used drama, movement, or music to stimulate creative imagery (Garaigordobil & Berruoco, 2011; Gundogan et al., 2013; Mages, 2018; Zachopoulou et al., 2006); five used mixed language and drawing (Dziedziejewicz, 2008; Dziedziejewicz et al., 2013; Jabłonowska & Stańczyk, 2008; Kyung-Won, 2000; Lopez-Martinez & Navaro-Lozano, 2010); four used integrated methods (Garaigordobil & Pérez, 2002;

McWilliams, 1984; Płóciennik, 2010; Wiśniewska, 2018); eight were based on fabularization, role-playing games, and pretend play (Chen et al., 2020; Dziejewicz et al., 2014; Hsieh & Chen, 2019; Karwowski & Soszyński, 2008; Morre & Russ, 2008; Ripple & Dacey, 1967; Thibodeau et al., 2016; Uszyńska-Jarmoc, 2007); and two were based on aesthetic activities (Gong et al., 2020; Limont, 1996). We categorized 21 enhancement interventions as cognitive and seven as complex training programs (denoted *cognitive+*), including motivational, social, or personality aspects. Stimulation time of creative imagery in the studies ranged from a few minutes to 48 hours (median = 10 hr). In 18 studies, the effects were assessed using performance tests; in four cases, parents' or teachers' ratings were used; and in six studies, interviews or product assessment were applied. Detailed characteristics of the studies included in the meta-analysis are presented in Supplementary Material in the online version of the journal (see Supplementary Table 1).

### The Overall Effect

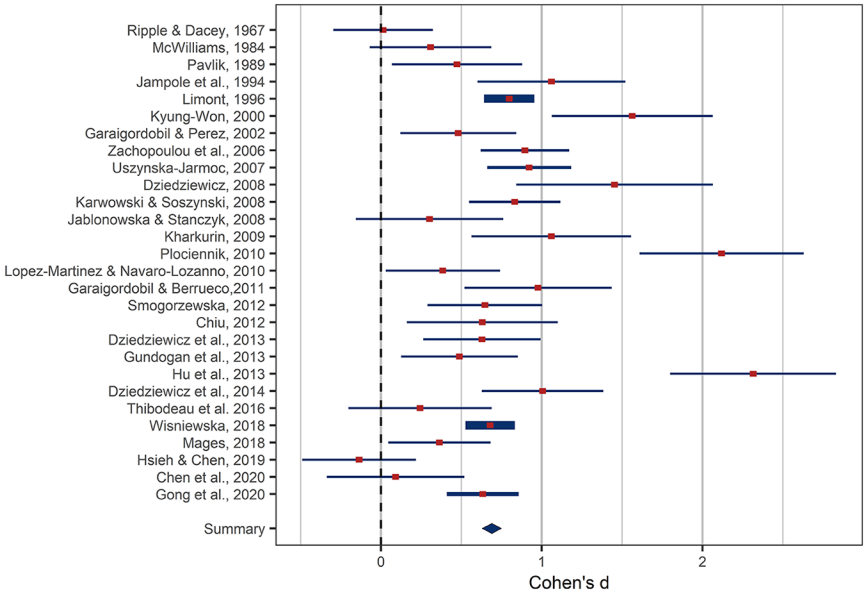
The overall effect obtained in the three-level model with  $k = 28$  studies and  $m = 89$  effects was estimated at  $d = 0.75$ , 95% CI [0.55, 0.94],  $p < .001$ . Thus, it was close to what is usually considered a large effect (Cohen, 2013). Importantly, though, heterogeneity around the point-estimate was significant,  $Q(df = 88) = 604.67$ ,  $p < .001$ . As illustrated in Figure 2, two outlying studies (Hu et al., 2013; Płóciennik, 2010) reported very large effects on relatively small samples ( $n = 97$  and  $n = 92$ , respectively).

We ran a sensitivity check in two steps. First, we conducted a leave-one analysis (i.e., we re-estimated the overall effect each time, excluding one study). The results varied from  $d = 0.70$  to  $d = 0.76$ , with  $d_{\text{mean}} = 0.73$  and  $d_{\text{SD}} = 0.01$ , so—while showing some variability—the overall conclusion of moderate-to-large effects held (see Supplementary Table 2). Our second sensitivity check was conducted with two outlying studies excluded. As expected, the overall effect decreased to  $d = 0.64$ , 95% CI [0.49, 0.78],  $p < .001$ , so overall effectiveness should be called moderate in terms of effect size (see Table 1). Studies' quality did not differentiate the effect size obtained ( $b = -0.01$ , 95% CI [-0.18, 0.17],  $p = .95$ ).

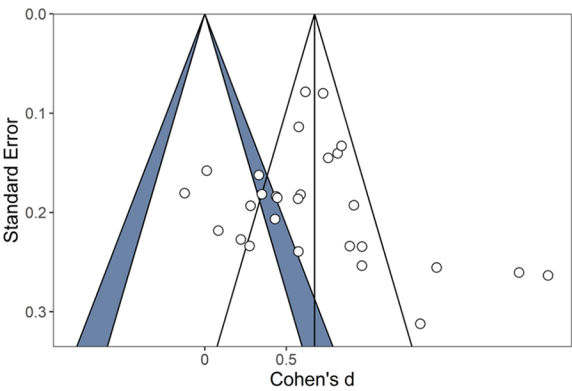
In the next step, we examined whether our estimates might suffer from publication bias (i.e., a tendency that small and hence often underpowered studies are getting published more easily if they report statistically significant effects). We emphasize that this effect does not necessarily denote that the literature is biased. Instead, it might illustrate the influence of studies that, while small and outlying in terms of the effect size, are well-conducted or utilize efficient methods and content.

We tested the possible risk of publication bias in two ways. First, we compared the effects obtained in published ( $k = 25$ ,  $m = 77$ ) and unpublished ( $k = 3$ ,  $m = 12$ ) studies. Although the published studies tended to provide higher estimates,  $d = 0.77$ , 95% CI [0.55, 0.98], than unpublished studies,  $d = 0.59$ , 95% CI [-0.02, 1.19], the difference between the two was not significant,  $Q(df = 1) = 0.30$ ,  $p = .58$ . Then, we analyzed the funnel plot (Figure 3), searching for its potential non-symmetry.

**FIGURE 2**  
**Forest Plot With Studies Included in the Current Meta-Analysis and Their Effects**



**FIGURE 3**  
**Funnel Plot With the Influence of Small Studies Identified**



**TABLE 1**  
**Effect Size of the Interventions, Results of Sensitivity Analyses and Publication Bias**

Effect	<i>d</i>	95% CI	<i>p</i>	<i>k</i>	<i>m</i>
Overall	0.75	0.55, 0.94	< .001	28	89
Sensitivity analysis					
Leave-1-analysis	0.73	—	< .001	27	88
Two outlying studies excluded	0.64	0.49, 0.78	< .001	26	87
Publication bias correction					
Trim-and-fill (published studies only)	0.77	0.55, 1.00	< .001	25	—
Trim-and-fill (published, outliers excluded)	0.65	0.49, 0.82	< .001	23	—

*Note.* *d* = Cohen's *d*; *k* = the number of studies; *m* = the number of effects.

Indeed, not only did the funnel plot seem asymmetric, with two relatively small studies providing the strongest effects, but this qualitative overview was confirmed by a significant Egger test (Sterne & Egger, 2001),  $z = 2.33$ ,  $p = .02$ , and the Kendall rank-test  $\tau = 0.33$ ,  $p = .02$ .

Publication bias analyses make it legitimate to conclude that the overall effectiveness of creative imagery training might be overestimated and should be considered moderate rather than large. Interestingly, apart from the funnel's asymmetry, the trim-and-fill analysis (Duval & Tweedie, 2000) did not suggest that additional studies with small effects should have been added to provide a more accurate effect size (see Table 1).

### Moderator Analyses

Table 2 presents a comparison of obtained effects depending on the moderators included. Participants' age cohort did not differentiate the effects obtained, as illustrated by the non-significant moderator test,  $Q(df = 2) = 0.02$ ,  $p = .99$ . Similarly, there were no differences between interventions that only measured creative imagery as the outcome and those that measured other characteristics,  $Q(df = 1) = 0.34$ ,  $p = .56$ . Although those interventions that focused solely on imagery seemed to provide a robust effect size:  $d = 0.86$ , it did not differ from the  $d = 0.71$  obtained in the other group. The measures used to assess interventions' effectiveness did not differentiate the overall effect either:  $Q(df = 2) = 1.60$ ,  $p = .45$ .

The main focus of the interventions (whether only imagery was planned to be developed or creative attitudes were also taken into consideration) marginally differentiated the effect size obtained,  $Q(df = 1) = 3.46$ ,  $p = .06$ , with robust effect of the interventions that aimed at developing creative imagery ( $d = 0.87$ , 95% CI [0.64, 1.10]) and moderate effect of broader interventions ( $d = 0.48$ , 95% CI [0.15, 0.82]). Different types of interventions resulted in similar effects,  $Q(df = 3) = 1.98$ ,  $p = .58$ . Although it seemed that the longer-term interventions focused on creative

**TABLE 2**  
**A Summary of Moderator Analyses**

Moderator	<i>d</i>	95% CI	<i>p</i>	<i>k</i>	<i>m</i>
Age group					
Children	0.76	0.54, 0.97	< .001	22	60
Adolescents	0.76	0.50, 1.01	< .001	5	16
Adults	0.72	0.19, 1.25	< .001	4	13
What was measured					
Imagery only	0.86	0.43, 1.28	< .001	6	43
Imagery <sup>+</sup>	0.71	0.49, 0.94	< .001	22	46
Measure					
Performance (test)	0.84	0.59, 1.09	< .001	18	65
Scale / questionnaire	0.60	0.07, 1.14	.03	4	6
Product / interview	0.56	0.13, 0.98	.01	6	18
Focus					
Cognitive	0.87	0.64, 1.10	< .001	19	67
Cognitive <sup>+</sup>	0.48	0.15, 0.82	< .001	9	22
Form of the intervention					
Longer-term imagery training	1.05	0.42, 1.67	.001	3	31
Short stimulation of creative imagery	0.64	0.02, 1.25	.04	3	8
Creativity training with imagery techniques	0.82	0.51, 1.13	< .001	12	25
Other interventions	0.60	0.26, 0.94	< .001	10	25
Intervention's content					
Dramatic play, creative movement, and music activity	0.74	0.17, 1.31	.01	4	9
Literary and verbal activity	0.79	0.38, 1.20	< .001	7	28
Verbal and figural activity	0.84	0.31, 1.37	.002	5	9
Multisensory stimulation interventions	0.93	0.35, 1.51	.002	4	14
Fictionalization, role-playing, pretend play	0.42	−0.01, 0.84	.055	7	14
Aesthetic and perceptive stimulation	1.36	0.91, 1.81	< .001	2	15

Note. *d* = Cohen's *d*; *k* = the number of studies; *m* = the number of effects.

imagery were most effective ( $d = 1.05$ ) while short interventions and other forms proved to be slightly less effective ( $d$ s around 0.60), these point estimates' CIs overlapped to a large extent.

The most important moderator from the point of view of our investigation was the content of activities undertaken during the intervention. This moderator significantly differentiated the effect size obtained,  $Q(df = 6) = 26.91$ ,  $p < .001$ . As illustrated in Table 2 (last rows), the effectiveness ranged from moderate in the case of pretend play and role-playing games ( $d = 0.42$ ) to quite high in the remaining cases.



## DEMOCRATIZING MOTIVATION: FROM CREATIVE SELF-BELIEFS TO CREATIVE SELF-REGULATION

As our meta-analysis demonstrated, there are many possible approaches to enhance creative imagery. However, the ability to produce even the most vivid and creative representations may still be perceived as invaluable in the school's reality and thus rarely openly expressed (Anderson & Haney, 2020). As the CBAA model theorizes, the motivation to be creative (Richardson et al., 2017) stems from the sense of agency. In other words, making creativity more salient in the school environment not only requires enhancing students' creative abilities but also building their creative selves.

The idea that we can affect how people function in a particular context by altering their psychological reality laid the foundation for many programs using the so-called wise interventions (Walton & Crum, 2021). In what follows, we overview the main assumptions of the "wise approach" along with different psychological mechanisms that have been targeted in such a manner. Then, we reflect on what makes wise interventions promising in democratizing different educational experiences. Finally, we discuss the prospect of supporting the creative self, namely creative self-beliefs and creative self-regulation, in a wise fashion.

A wise approach means being mindful of the psychological processes through which people construe the meaning of themselves, others, and life experiences (Walton & Crum, 2021). Given how crucial people's interpretations and beliefs are for their actual behavior, wise interventions alter them into more positive and adaptive ones. Hence, what differentiates a wise approach from other traditions of psychological interventions is that it does not aim at changing the objective characteristics of a situation but rather recalibrates how people view and assess these circumstances.

How to make sure that students' subjective interpretations of the educational experiences allow them to fulfill their potential and achieve better academic, social, and emotional results? Different theoretical perspectives addressed these questions, leading to diverse wise interventions. Some of them targeted students' sense of belonging and taught that it is normal for everyone to struggle with belonging uncertainty and that such worries are likely to wear off over time (e.g., Walton & Cohen, 2011). Others, known as utility-value interventions (e.g., Harackiewicz et al., 2016), helped students acknowledge a personal value in what they learn. The educational benefits were also observed when showing people that social group differences resulting from diverse life experiences and backgrounds can become a source of strength rather than an obstacle (e.g., Townsend et al., 2019). Similarly, teaching that finding a path towards a desired future is achievable (e.g., Oyserman & Lewis, 2017) served as an effective way to strengthen people's functioning. Furthermore, the interventions that can potentially have a critical role in universalizing creative learning experiences cultivate students' growth mindset; they promote the perception of people's abilities and other important characteristics as alterable and thus learnable (e.g., Yeager et al., 2019). Presumably, supporting such a growth-oriented approach about creative abilities can be crucial in preventing the experience of creative mortification (Beghetto & Dilley, 2016).

In general, we see at least six arguments why conducting wise interventions might be beneficial for democratizing educational opportunities and creative learning experiences. First, wise interventions are usually brief and simple (Yeager & Walton, 2011) and thus possible to be introduced broadly and at no or low cost—not just among the small fraction of students who have access to extra-curricular programs. Second, interventions conducted wisely are embedded in participants' real-life context (Walton & Yeager, 2020): They rely on making tiny changes in the already existing situation and do not aspire to revolutionize the entire domain. Hence, the way people view their creative capacities and assess their readiness to express creativity in the school environment can be influenced daily, during regular classes, and in typical school conditions. Third, targeting people's system of beliefs may prompt an avalanche of changes that will reinforce each other (Walton & Wilson, 2018). Fourth, once a person starts to view one's own experiences from a more adaptive perspective, the changes occur in all the person-environment interactions, not just at a single point in time when the intervention was conducted. Five, a wise approach focuses on self-powered processes, translating into prolonged, rather than rapidly fading-out, change.

The sixth, and perhaps the most compelling argument, is that wise interventions seem to be particularly effective and well-suited for disadvantaged students (Burnette et al., 2018). Such a tendency is constantly demonstrated in various interventions that support young people in solving their day-to-day personal problems and reduce educational inequalities. For instance, students from negatively stereotyped groups or those underrepresented in a particular context benefited more from the social-belonging intervention (Williams et al., 2020). Furthermore, the effects of interventions are usually the strongest among students from low socioeconomic status households (Destin, 2017). An overwhelming body of research demonstrated that the impact of the utility-value intervention could be moderated and boosted by such students' characteristics as low success expectations (Hulleman & Harackiewicz, 2009), history of poor prior achievement (Rosenzweig et al., 2020), or being a member of a traditionally marginalized group (Harackiewicz et al., 2016). Similarly, the growth-mindset interventions improve school achievement mostly among students who face academic challenges (Yeager et al., 2019). In summary, an abundance of evidence suggests that students who are most in need also benefit the most from wise interventions.

Although the effectiveness of wise interventions has been demonstrated across various educational contexts (for a summary, see Walton & Crum, 2021), attempts to implement such an approach into creativity development are sparse. One possible explanation for this gap arises from the ongoing debate on expecting any gains in creativity when conducting short-term, one-shot interventions (e.g., Cropley, 1997). Still, there is limited yet promising evidence that well-focused interventions can also benefit young people's creativity, including their creative self-beliefs. Consider an intervention (Mathisen & Bronnick, 2009) where university students' creative self-efficacy was enhanced during 5-day and 1-day interventions. The positive effect was detectable after 2 months from course completion. Furthermore, in a 3-hr-long workshop (Poon et al., 2014), a group of secondary school students was given

numerous occasions to learn about creativity and to gain the confidence to express it. Students were taught why creativity is essential and what thinking techniques can help with generating creative ideas. They were also encouraged to present solutions to practical problems. In the self-report feedback gathered at the end of the workshop, students were more knowledgeable about creativity and confident to exhibit their creative potential. A recent study (Zielińska, Lebuda, & Karwowski, in press) showed that targeting students' creative confidence and appreciation for creativity not only led to a subjective impression of being more creative but also to a higher engagement in real-life creative activity. During a 16-day online diary study, university students were given simple tasks to be submitted the following day. Completing a task took just a few minutes and required participants to focus on creativity briefly: to consider its relevance and variety of faces. On days when students performed these non-demanding tasks, they did indeed undertake more everyday creative activities, such as taking photos, writing blog entries, or preparing an original recipe.

Notably, such motivational strength, fueled by a solid creative self-concept and cherishing creativity, can be further complemented. Just as it has been typically emphasized in the context of the learning process (e.g., Zimmerman, 2011), it does not seem likely to achieve learning success without the means to pursue goals and intentions. Such a notion is also reflected in the pathways interventions convincing that it is crucial to have a *destination* and a *path* toward this goal (Oyserman & Lewis, 2017). To put it less metaphorically, even highly motivated students who perceive themselves as creative need particular strategies—ways of acting and thinking—that allow them to fulfill their creative potential. Processes through which a person shapes their thoughts, emotions, and behaviors constitute a broad category of self-regulation (Hofmann et al., 2012)—one of the most intensively studied concepts in educational psychology (e.g., Weinstein et al., 2011). Given the importance of self-regulatory mechanisms for the learning process, many interventions have been designed to support such skills among students (e.g., Jansen et al., 2020). However, neither the theoretical frameworks explaining the role of self-regulation in creativity nor all the more practical endeavors to enhance such control processes while engaging in a creative action are abundant (but see Ivcevic & Nusbaum, 2017). Recent works attempting to describe the creative process from the self-regulated learning perspective (Callan et al., 2019; Spoon et al., 2021) will hopefully inspire researchers to explore the possibility of improving creative self-regulation by well-planned and precisely conducted interventions. In Table 3, we overview how such a wise approach in supporting both creative self-beliefs and self-regulation may be incorporated into the existing educational activities.

## DISCUSSION

In this chapter, we attempted to untangle different ways of how to democratize creativity in educational settings. We focused on two particular aspects of this democratization, as suggested by the recent CBAA model of creative action (Karwowski & Beghetto, 2019). First, we were interested in the possibilities to strengthen and

**TABLE 3**  
**A Road Map of How to Incorporate a Wise Approach Into Existing Educational Practices to Infuse Creativity**

Targeted Mechanism	Example Studies That Could Inspire Creativity Interventions	Examples of How to “Wisely” Enhance Creativity
Growth creative mindset	<p>Growth mindset of intelligence interventions: Blackwell et al., 2007; Paunesku et al., 2015; Yeager et al., 2019</p> <p>Incremental theory of personality interventions: Miu &amp; Yeager, 2015; Yeager, Trzesniewski, et al., 2013, 2014</p>	<p>1. Providing compelling, scientifically-based information about creativity and presenting it in an attractive and age-appropriate way (e.g., through a gamified learning activity or psychoeducational presentation); the key take-home messages of such intervention could be as follows:</p> <ul style="list-style-type: none"> <li>• with practice, effort, effective strategies, and help from others, people can become more creative, as illustrated by the effectiveness of various forms of creativity training,</li> <li>• there are many potential trajectories of creative growth,</li> <li>• creativity is not restricted only to the eminent and may be expressed in a variety of ways (see Karwowski, Czerwotka, et al., 2020),</li> <li>• creativity rarely stems from sheer insights and instead results from putting effort into long-term work and practice.</li> </ul> <p>2. Presenting testimonies from other students (e.g., older or more advanced) as well as from renowned creators, in which they describe their paths towards creative success: what challenges they had to overcome, what they struggled with, and how they (re)interpreted these difficulties as opportunities to creative growth. This may have a form of face-to-face meetings (i.e., meet-the-author sessions or simply hosting older students at a class), stories told by teachers, presenting interview quotations from students and creators, or even incorporating a growth mindset narration when providing feedback on any class assignment.</p> <p>3. Prompting students (e.g., through brief writing exercises) to reflect on how they can utilize creativity when pursuing their goals.</p> <p>4. Giving writing assignments—a so-called “saying-is-believing” exercise—in which students are asked to explain to their younger friends what it means to develop their own creativity, what it takes to do so, and how they can benefit from being more creative in their day-to-day life.</p>

(continued)

TABLE 3 (CONTINUED)

Targeted Mechanism	Example Studies That Could Inspire Creativity Interventions	Examples of How to “Wisely” Enhance Creativity
Creative confidence	Task value interventions: Harackiewicz et al., 2016; Hulleman et al., 2017; Kosovich et al., 2019; Rosenzweig et al., 2019	1. Direct presentation of how creativity can be useful in people’s everyday life (e.g., by telling stories, showing inspirational videos, providing quotations from peers who have found value in creative solutions, and asking whether and how students relate to such examples). 2. Prompting students to reflect on how creativity is related to something in their lives—be it hobbies, interests, personal goals or simply their daily routines. Students may be encouraged to write short essays, blog entries, or social media posts in which they describe how being creative can be (or already is) useful for them. They may also be asked to write a letter to a friend or parents to propose how they can be creative in their lives and why it is worth trying such a creative approach. 3. Regular exercises (see Zielińska, Lebuda, & Karwowski, in press) in which students are prompted to observe and identify original and surprising solutions when engaging in everyday activities (e.g., watching TV, surfing the internet, or playing sports) or encouraged to play with simple yet innovative solutions in their everyday life (e.g., finding a new way of organizing a desk or coming up with new rules for a well-known game). Along with such assignments, students may also be provided with worksheets or booklets of diaries, in which they describe reflections on how they incorporated creativity in their daily activities.
	Perceived value of creativity	These interventions could be similar to the interventions targeting creative confidence, yet the focus here would be more on the personal relevance of creativity and not only its utility value. These may include activities that engage the whole classroom during regular classes (e.g., presentations on what and why creativity matters in different professions and leisure activities, providing quotations from people who appreciate creativity and consider it important in their lives) as well as student-level tasks to be completed outside or inside the classroom (e.g., simple writing assignments, in which students are asked to reflect on why creativity could be important for them, what creative activities they would find interesting, and which creative domain they could identify with).

(continued)

TABLE 3 (CONTINUED)

Targeted Mechanism	Example Studies That Could Inspire Creativity Interventions	Examples of How to “Wisely” Enhance Creativity
Creative self-regulation	Self-regulated learning interventions: Daumiller & Dresel, 2019; Devolder et al., 2012; Dörrenbächer & Perels, 2016; McDaniel & Einstein, 2020; Schmitz & Perels, 2011; Schmitz & Wiese, 2006; Stoeger et al., 2014; Tsirotakis et al., 2020	1. Providing scaffolds that support different areas (cognitive and non-cognitive) and phases (planning, monitoring and maintaining, self-reflection) of creative self-regulation. Although the current trends in supporting students’ self-regulatory abilities cluster around digital environments and introducing new technologies in the classroom, more traditional forms of interventions—implemented during regular classroom and homework instructions—seem equally important in the context of democratizing creativity. In such interventions, students may be explicitly instructed to use particular cognitive strategies (e.g., planning, perspective taking, brainstorming, metaphorical thinking) while working on an assignment, to monitor their activity and progress made (through self-questioning and metacognitive feedback), and to acknowledge which elements of the assignment they find personally interesting, significant, and useful. Students may be prompted to more deliberately approach a creative task by being asked to fill in paper worksheets or diaries. Also, providing feedback with an eye on different types of strategies—cognitive, metacognitive, and motivational—that can boost creativity might encourage students to try them out during future assignments.
		2. Inviting students to explore and practice different self-regulatory strategies that have been found beneficial for creativity during simple gamified exercises combined with traditional teaching methods (e.g., using points, levels, leaderboards, collaborative and/or competitive challenges, introducing secret content that has to be unlocked, allowing students to customize some elements of an activity).

develop a vital aspect of creative potential: creative imagery abilities. Second, our review narratively explored the opportunities to create conditions that support creative self-beliefs and creative self-regulation, understood as ways to make creative activity more likely. In what follows, we discuss and summarize the main implications of our review.

### **Democratizing the Cognitive Side: Creative Imagery**

On the cognitive side, we explored creative imagery abilities as an essential aspect of creative cognition. Because imagery primarily employs nonverbal modes of functioning, focuses on the vividness of mental images, their originality, and conceptual transformations, it serves as the aspect of abilities that is less intelligence-dependent (Abraham et al., 2005). Thus, we postulate that by focusing on creative imagery, scholars and practitioners might make creative skills more broadly accessible. This is in line with previous studies, which postulated that including creativity in college admissions might make it fairer (Pretz & Kaufman, 2017), and works which posited that spatial abilities, closely aligned with creative imagery (Finke, 1990), are a sleeping giant for identifying giftedness (Lubinski, 2010). In short, creative imagery abilities matter and creativity literature should focus on them more than it has done so far. Creative potential is not divergent thinking alone and should not be restricted to it (Reiter-Palmon et al., 2019).

How can creative imagery be strengthened, and are the interventions conducted to do so effective? In the meta-analysis we have undertaken, we were less focused on general effectiveness and more on interventions' conditions, circumstances, and content. The overall effectiveness our meta-analysis revealed was comparable to the effects obtained in the previous syntheses of creativity training effectiveness and quite robust overall. Moreover, our moderator analysis demonstrated that the overall effect was reasonably stable. It did not differ according to the age group the intervention was devoted to and did not depend on the measurement of the dependent variable or interventions' length. Importantly, however, we observed statistically significant differences between programs that differed in their content. The effectiveness varied from modest in programs based on the role-playing games to high in those that utilized aesthetic and sensory stimulation. Although the small number of studies per category makes firm conclusions premature, we emphasize that several different approaches to stimulating creative imagery resulted in comparably high effects. This conclusion—a possibility to effectively support creative imagery using a variety of approaches—seems particularly relevant, given our focus on the democratization of creative abilities. Indeed, there are more ways than one to support this aspect of creative cognition, and divergent thinking focused creativity training is not the only approach that serves well. Creative imagery was effectively supported in interventions that utilized literary and verbal activity, multisensory stimulation, verbal and figural activity, or aesthetic and perceptive stimulation. Programs based on drama, movement, and music were slightly less effective, yet they still increased imagery. Thus, our synthesis provides some



arguments that creative ability—creative imagery in this particular study—might be effectively supported and that there are many ways to do so. Democratization might also mean openness toward new approaches, and there is indeed space for more creative solutions to develop creativity.

### Democratizing the Motivational Part: Creative Self-Beliefs and Self-Regulation

The CBAA model focuses on cognitive and motivational factors associated with creative self-beliefs: creative confidence and valuing creativity. Cognitively understood creative potential serves as the building block for creative actions; yet, to undertake these actions, individuals must perceive themselves as able to meet the task's requirements and value creativity.

While not enough studies are devoted to stimulating creative self-beliefs or creative self-regulation to draw firm conclusions, growing interest in non-cognitive characteristics outside of creativity literature provides some promising, even if indirect, reasons to perceive this line of investigation as worthwhile. In short, the wise interventions we overviewed are brief, inexpensive, scalable, and seem to be particularly useful in the case of those students who come from low-SES families or environments where creativity is not considered valuable. Therefore, building such students' creative confidence and showing them why creativity matters is a challenge of particular relevance.

### Limitations and Future Directions

Our review—quantitative in the case of creative imagery and narrative when it comes to motivational aspects proposed in the CBAA model—is not without limitations. We particularly acknowledge three of them. First, our selection criteria of studies included in the meta-analysis resulted in the exclusion of many works that seem promising as a way to democratize creative experiences even further. We did not include them, as they neither focused on creative imagery nor measured it. Yet, it is essential to remember that creative imagery is not the only aspect of creative cognition that should be cherished in school settings. Therefore, a more inclusive systematic review of the effectiveness of creative pedagogies (Cremin & Chappell, 2019) should supplement our analyses.

Second, our meta-analysis was relatively small in terms of the number of studies included. This makes the estimates of moderators' effects potentially unstable. It is also important to note that the overall sample in the 28 studies we included was relatively low. The total sample in the studies included in our meta-analysis was only 4,424 and the average sample size per study was at  $n = 158$ , with several studies conducted on even smaller samples. Therefore, more extensive interventions, preferably pre-registered, are necessary to replicate previous findings and strengthen the obtained conclusions.

Third, we could not meta-analyze the effects of wise interventions devoted to supporting creative self-beliefs and self-regulation. The reason was evident—there were

not enough of such studies. That being said, we believe that to democratize creativity, researchers and practitioners should focus on cognitive and motivational characteristics equally. Our reasoning was primarily inspired and driven by the CBAA model; yet, importantly, we felt that creative self-regulation (Zielińska & Karwowski, in press) was the missing point in this model. Therefore, future studies should explore how to develop creativity-relevant mental skills and teach students to plan, monitor, and regulate their creative activity.


## CONCLUSIONS AND RECOMMENDATIONS FOR PRACTICE

Creativity is vital for several reasons and it is not enough to occasionally conduct creativity training or problem-solving sessions to allow creativity to flourish in schools. More ways to support creativity and overlooked aspects of creative cognition and motivation should be addressed if we are to seriously consider supporting and democratizing it. As our meta-analysis demonstrated, there are many ways to effectively enhance creative imagery—a sleeping giant of creative skills. Equally importantly, it is crucial to create opportunities that will allow students to develop their creative confidence and convince them that creativity matters. Finally, we should teach students how to manage the activity, deal with obstacles, plan actions, and complete them. In sum, we believe that supporting students in putting their creative potential into observable creative action might benefit from following a four-fold path. First, teachers might want to (and have means to) enhance students' creative potential, including their creative imagery. This support can be organized in various ways, and creativity training is only one of them. Second, the focus should be made on nurturing young people's creative self to make creative pursuits more desirable. Third, it is vital to boost children's and adults' creativity-related self-regulatory skills to make creative success more achievable. Fourth, and finally, intervening wisely could make creative learning experiences more accessible.

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## NOTES

<sup>1</sup> Mental imagery can take many forms, with visual imagery being the most common dimension of mental imagery addressed in psychological research. This dominance likely forms the reason why researchers tend to equate mental imagery with visual imagery (e.g., LeBoutillier & Marks, 2003). Studies on individual differences in mental imagery emphasize imagery ability measured as the quality of mental images, with particular attention paid to images' vividness (McAvinue & Robertson, 2007). Creative imagery ability or creative imagery are terms that are used to describe the creative nature of generated and transformed mental

images (Jankowska & Karwowski, 2020). Creativity literature also uses the terms “fantasy” (Weibel et al., 2018) and “creative imagination” (Karwowski & Soszyński, 2008). Usually, researchers use these terms to emphasize the use of mental images to generate new ideas, stories, or narratives.

<sup>2</sup> We decided to add the term “imagination” to our search string given that—as we already mentioned—creative imagination is often studied alongside creative imagery (e.g., Horng et al., 2021, but see also Glăveanu et al., 2017, for a more precise distinction between these two constructs). Somehow, this broad search string resulted in a large number of studies that were excluded as not fulfilling our inclusion criteria, mostly because they were theoretical in nature.

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