CHAPTER 18

Four Faces of Creativity at School

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Introduction

Over the decades of the development of creative education, scholars have devoted a great amount of attention to understanding children's and young people's creative potential. This potential was usually defined through cognitive characteristics – mainly divergent thinking (Runco, 2015), creative imagination (Dziedziewicz & Karwowski, 2015; Jankowska & Karwowski, 2015), or problem solving skills (Voss & Means, 1989). However, creativity requires more than just abilities. Certain personality traits – especially openness and independence (Feist, 1998) – as well as intrinsic motivation (Amabile, 1993) or creative self-efficacy (Beghetto, 2006) may be perceived as elements of the complex mosaic of creative potential (Karwowski, 2015; Karwowski & Lebuda, 2016; Lubart, Zenasni, & Barbot, 2013).

In this chapter we briefly sketch a new model of creativity, understood as a dynamic interplay between creative abilities and those personality traits that, we believe, are crucial to creative activity, namely openness and independence. This leads us to the typological approach and four distinct types of creativity, briefly described later in the chapter. We explore these characteristics and focus especially on the usefulness of this approach for teaching creativity.

Teachers' perceptions of creativity are complex, but too often they are not complex enough. When asked what child creativity is, a great majority of teachers would probably define it with reference to at least one aspect of creative thinking. Most frequently, it would probably be originality ("non-schematic thinking," "creates new solutions") or fluency ("has lots of ideas"). Sometimes they would probably also refer to creative imagination ("fertile imagination," "fancy"), as well as openness to experience ("curious about the unknown," "eager to take up new challenges"). Indeed, decades of research into teachers' implicit theories of creativity show that the characteristics of creative students they list most frequently mainly refer

to students' cognitive functioning, followed by personality and motivation (Andiliou & Murphy, 2010). Unique or original, imaginative, curious, and open to experience are those characteristics of students that occur in most of these analyses (Andiliou & Murphy, 2010; Chan & Chan, 1999). This leads to the conclusion that teachers' perception of a creative student is dominated by individual (cognitive and personality) characteristics rather than by activity, process, or product factors (Gralewski & Karwowski, 2016). We presume, however, that a too linear understanding of creativity – regardless of its types, contexts, and dimensions – may in fact limit attempts to develop creative potential, especially in the case of young children. When teachers' naive theories excessively focus on the person, they are dangerously close to the fixed mindset – the conviction that a child possesses a particular trait or not, and that not much can be done if the child does not exhibit it (Dweck, 2006; Karwowski, 2014; Plucker, Beghetto, & Dow, 2004). Creativity in childhood – especially mini-c creativity – is clearly linked with the process of learning (Beghetto, 2016; Beghetto & Kaufman, 2009). To satisfy their natural curiosity, children engage in many activities and gain new experiences as they do so. These pursuits may be early manifestations of openness to experience or willingness to emphasize individual independence. This is why it seems so important to conduct a profile analysis of creativity incorporating signs of creative potential in both intellectual and personality spheres. This chapter aims at presenting the usefulness of such an approach.

Towards a Typological Approach to Creativity

Creative abilities (mainly divergent thinking and creative imagination), openness, and independence are associated with one another, but these associations are usually, at best, moderate (Feist, 1998; Feist & Brady, 2004; McCrae, 1987). Therefore, although on the one hand it seems reasonable to combine them while describing creative people, on the other, such combination should not be treated as a single dimension of creativity (a continuum, as is the case with the adaptors-innovators theory; Kirton, 1976). Instead, we propose a typological approach to creativity (TAC; Karwowski, 2010a).

The understanding of creativity as a multifaceted phenomenon alone is, obviously, not new. Similar, multidimensional approaches are present in the literature (i.e., Lubart et al., 2013) – for example, such an understanding of creativity forms the foundation of the Test for Creative Thinking – Drawing Production (Jellen & Urban, 1989), based on a componential
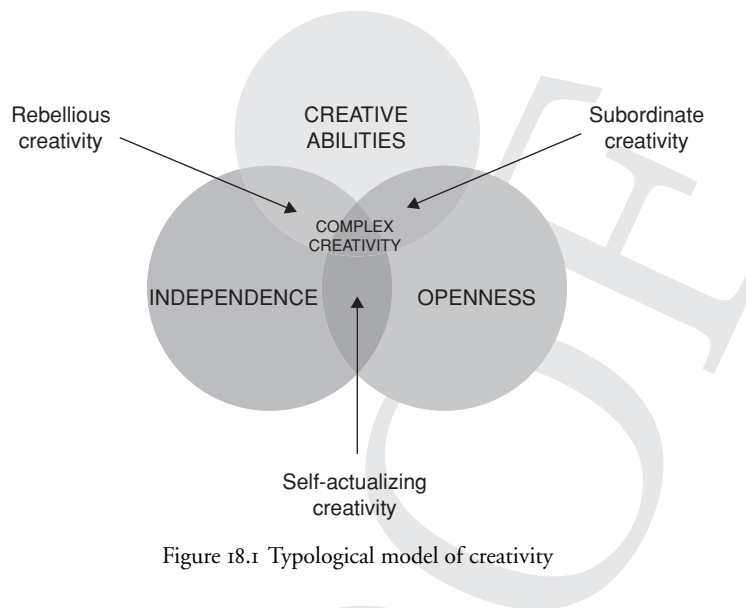
Figure 18.1 Typological model of creativity

model of creativity (Urban, 2005), with creativity seen as composed of abilities (divergent thinking, general abilities, specific knowledge, and abilities) as well as motivational and personality characteristics (tolerance of ambiguity, motivation, and task involvement).

The typological approach to creativity (TAC; Karwowski, 2010a) focuses on the relationship between three dimensions crucial to creative activity and achievement, namely: (1) creative abilities – cognitive characteristics that determine the effectiveness of generating, developing, and implementing solutions characterized by a high degree of originality and value, or divergent thinking and creative imagination, among other things; (2) openness – appreciation of intellect, learning, and willingness to meet new people and cultures; and (3) independence – nonconformity and low agreeableness, as well as readiness to oppose the situationally induced impact of the group and external factors (see Figure 18.1). These dimensions are continuous: individuals are not creatively gifted and lacking this gift, open and rigid, or dependent and independent, but they differ in the intensity of these characteristics.

The proposed model emphasizes the special role played by four basic types of creativity: complex (high creative abilities, openness, and independence), rebellious (high creative abilities and independence combined with low openness), subordinate (high creative abilities and openness

combined with low independence), and self-actualizing (high openness and independence combined with low creative abilities).

We postulate that this model should serve as a heuristic representation when analyzing different forms of creativity rather than being treated as a typology that shows stable and unchangeable categories. The types we describe in this section are not carved in stone; on the contrary, they are flexible and open to development and progress. Hence, even when we characterize the most typical profiles and behaviors of each of the types, this does not mean that people – including students – should be perceived as representatives of one and only one type. Membership in each of these categories may change in time, because of personality development (Lucas & Donnellan, 2011), but also because of educational interventions.

Such an understanding of creativity – treated as a complex characteristic that determines the chances and probability of getting involved in creative activity and succeeding in it – may be of special importance when it comes to the development of children and young people as well as to their school functioning. To understand the mechanisms governing the transition from mini-c creativity to little-c creativity, or even to Pro-c and Big-C creativity (Kaufman & Beghetto, 2009), is one of key tasks for educational psychology of creativity. Creative potential should be considered as a necessary but insufficient condition of creative achievement. Perseverance (Prabhu, Sutton, & Sauser, 2008), maturity and coherence of identity (Helson & Pals, 2000), synergy of intrinsic and extrinsic motivation (Amabile, 1993, 1997), appropriate level of intelligence (Karwowski, Dul, Gralewski, Jauk, Jankowska, Gajda, Chruszczewski, & Benedek, 2016; Karwowski & Gralewski, 2013), domain-specific knowledge (Simonton, 2009), and environmental support (Sternberg & Lubart, 1995) – all these and many other factors add to its fulfillment. Yet very likely, all those moderators and mediators of the relationship between creative potential and creative achievement may additionally be moderated by the creativity type the given individual shows.

Initial empirical analyses of the TAC (Karwowski, 2010a) show differences between the types of creativity in both social characteristics (i.e., socioeconomic status, parental attitudes, family situation, perceived climate for creativity at school, teacher leadership perception) and psychological characteristics (i.e., differences in creative self-efficacy, values, personality, interests), as well as in the effectiveness of school functioning. What follows is a short summary of the key findings.

Complex creativity. Complex creativity children usually form a group of no more than 3 or 4 pupils in a 30-pupil classroom, and are characterized

by high openness, independence, and creative abilities. Research shows (Karwowski, 2010a) that such individuals are also characterized by a high level of social competencies and considerable extraversion. They are confident about their own creative abilities (hence their high creative self-efficacy; Beghetto, 2006) and consider creativity to be an important part of their self-description (consequently, they also exhibit high creative personal identity; Jaussi, Randel, & Dionne, 2007). In line with these observations, such people also value intellectual autonomy and emotional independence highly while attaching less importance to maintaining social order. So, even if sometimes they are indeed rebels, they are constructive rebels who offer their own valuable solutions during classes. They are usually intrinsically motivated (Amabile, 1993); in the activities they undertake, they are more driven by the pleasure that stems from the activity itself than by rewards and external reinforcements. They do well at school but rarely are top of the class, and they tend to perceive the climate at their schools and classrooms as not very creative (Karwowski, 2010a).

The complex creativity type is clearly linked with the family's social and economic status. Not only is the parents' education higher in this group of people than in the overall population, but an overrepresentation of individuals from large cities and private schools is visible here. Individuals exhibiting this type of creativity are most frequently the only children or the oldest ones in their families. Parental attitudes also make this group different from the others – both mothers and fathers are perceived as loving, and their parental attitudes are commonly characterized by a low degree of protective and controlling approach.

Rebellious creativity. Students representing the rebellious creativity type form a group of two to three individuals in a typical classroom (composed of approximately 30 pupils), and they are much more frequently boys than girls. Individuals from this creativity type are characterized by relatively low social competence, which in fact makes it harder for them to function effectively. In conflict situations – inevitable at school and in life – they mostly apply avoidance strategies or go for confrontation (Karwowski, 2010a). Demotivation is a problem in activating their creative potential; the level of both intrinsic and extrinsic motivation in this group is clearly lower than among other students. It is therefore difficult to arouse enthusiasm in students characterized by this type of creativity and encourage them to take action, regardless of whether one uses rewards or more intrinsically rooted arguments. Creativity is not one of the values they appreciate the most, although they do enjoy intellectual autonomy and agency – dimensions that are important for creativity. When we add average creative self-efficacy,

this profile of creativity becomes complete. Consequently, we are dealing with individuals who have the cognitive potential to function creatively, but their low openness, coupled with high nonconformity, may form a barrier preventing the development their creativity. This type clearly shows that creative abilities alone are not enough for creative potential to be actualized when an individual lacks creative self-efficacy and creative personal identity as well as intrinsic motivation (Karwowski, 2010a).

Representatives of this group report being rejected by fathers and mothers more often than the average; they also report being less intensely loved by their mothers. Adverse family relationships and a feeling of rejection is the clearest strain of family characteristics in this group. These young people perceive school with similar aversion – most often they describe the climate there as bad, both in the sphere of relationships with others and in how much support they receive in the tasks they undertake (Karwowski, 2010a).

Subordinate creativity. About 4 pupils in an average 30-pupil class may be described as subordinately creative. Cognitively (creative abilities) and in terms of personality (openness), students representing this type seem to have all that is necessary to identify and solve problems. However, their conformism makes their functioning in many situations more difficult, especially when those situations contain the elements of risk. This profile represents the essence of an adaptive style of creativity (see Kirton, 1976); this is why such individuals improve something rather than change reality in a revolutionary way.

More often than the general population, these students come from families characterized by low socioeconomic status, and the attitudes of their parents (especially mothers) are exhibiting stronger protective behaviors. They rate the climate of the schools and classes they learn in positively and highly, so they adapted well there. They also highly appreciate the leadership of their teachers (Karwowski, 2010a). They generally do well at school, which may partially be due to their high level of conscientiousness (Gajda, Karwowski, & Beghetto, in press). Moreover, they are characterized by a high level of intrinsic motivation. In conflict situations, they most frequently apply strategies of cooperation and compromise. They do not seek to dominate; instead, they value partner relationships and peace. Therefore, these individuals are well adapted to the surrounding reality, and although they are endowed with creative potential, they do not seek to achieve it at all costs, nor do they create in a revolutionary way. Therefore, one should not expect them to engage in activities that radically depart from the status quo, but when they work in a group under the right

leadership, they are able to achieve valuable creative results (Karwowski, 2010a).

Self-actualizing creativity. The type of self-actualizing creativity children includes individuals who are open and independent but lack creative abilities that enable effective problem-solving and developing creative ideas. On average, the group includes 2 or 3 pupils in every 30-pupil class. These are individuals who value openness as well as independence in functioning and relations with others more than creative activity. They are also characterized by developed social skills – they do particularly well in situations of social exposure. In relation to the entire population, this group is distinguished by a slightly higher level of intrinsic motivation; consequently, these students want to act for the pleasure that stems from the process of acting, although the action is not always associated with creativity. This is validated by the fact that they do not value creativity so much. Instead, among the dimensions they do value highly there are emotional independence and social position (Karwowski, 2010a). Among different parental attitudes, the only difference between this group and the general population is that individuals characterized by self-actualizing creativity more frequently consider their fathers to be less demanding. Students characterized by the self-actualizing creativity profile usually do not value creativity very highly and do not exhibit an especially high creative self-efficacy; as a result, they infrequently undertake creative activities. This is why, when one wants to develop their creative potential, one should motivate them to undertake activities in domains that are associated with creativity, encourage them to boldly offer non-typical solutions, and to emphasize the importance of intellectual autonomy in group work. The strengths of this type of creativity (openness, developed social skills, high degree of intrinsic motivation) should be used to increase the willingness of these individuals to engage in creative activity. The effectiveness of stimulating creative abilities is well corroborated, and there are many ways to stimulate the creative potential of this group (Scott, Leritz, & Mumford, 2004).

Identification of Students' Type of Creativity

Not only are people not equally creative, but they are not creative in the same ways, either. While our estimates show that the four types of creativity described in the preceding section make up the total of almost half of an average class, more or less one out of ten individuals may be identified as a complexly creative child. Consequently, in an average class, there are likely to be two-to-three students characterized by this particular

profile of creativity. But how does one identify the remaining types of creativity?

The profiled identification of creativity we encourage makes it possible to determine the type of creativity that a particular student usually exhibits. We believe that individual dimensions (intellectual and personality related) should be rated in comparison with other students, but also in a more ipsative way: showing the individual's strengths and weaknesses. As a consequence of such assessment, it is possible to plan the stimulation of creative potential in a way that is concordant with the profile of individual differences.

Responding to the demand for methods that make it possible to conduct profile assessment of creativity, we developed the Types of Creativity Questionnaire (TCQ) (Karwowski, 2015a) for older students. This questionnaire enables valid and reliable measurement of creative abilities, openness, and independence, and makes it possible to determine which types of creativity individuals represent. Currently, we are also working on the Types of Creativity Observation Scale for the assessment of younger pupils. This instrument is composed of two observation sheets that include statements that describe particular behaviors of a child (at home, in a kindergarten, or at school). As in the case of TCQ, these behaviors are indicators of creative abilities, openness, and independence. Sheets are completed by one of a particular child's parents and a teacher.

Supporting Students' Creativity: Holding Types in Mind

The typological approaches we propose make up a particular, potentially supportive system thanks to which teachers can better understand (and support) students' creativity. However, as is the case with any typology, it can bring benefits, but it can also carry some risks. The first example of the latter is associated with unreflective ascription of particular creativity types to students and consideration of these identifiers as unchangeable. It is important to remember that any type of support must aim at development of students' creative potential. However, even the type we defined as "complex creativity" cannot be considered as the point of arrival and the final step toward the development of students' creativity. It is therefore a mistake to think that students who fit in with the complex creativity type, characterized by high openness, independence, and creative abilities, do not require any special support anymore. First of all, a type is a theoretical classification category whose aim is to facilitate identification of strengths and those areas that require support, which requires application of some

generalizations. After all, in practice, we infrequently come across the so-called *flat profile* that is characterized by low internal variability, and this is why even in case of complex creativity one can identify differences in the intensity of individual elements of a creative potential. Finally, even a relatively harmonious profile of complex creativity can still be developed further. It is important to note, after all, that even a very high level of creative potential does not yet warrant eminent creative achievement. Transfer from potential to its fulfillment in particular areas of life is the main task of those who work with students characterized by this profile.

It happens that pupils characterized by high creative potential are not aware of their own abilities, and for this reason they do not search for occasions to develop them. In case of rebellious creativity, we are dealing with pupils who have the potential for creative functioning, but their low openness at a high level of nonconformism is occasionally a source of overall demotivation that pervades their functioning. They need someone who would suggest to them the domain where they could grow, or who would indicate a challenging problem for them to solve. Of course, this person can be a teacher, although this task is not at all easy. The key to success may be to understand the causes of the pupils' lack of motivation and openness that blocks their desire to act. Ordinarily, these causes are lack of self-confidence and/or lack of goals. Pupils who lack self-confidence usually focus on what they would like to do rather than what they have already achieved. Frequently, low social competencies result from this lack of confidence. Another reason for forsaking creative activities may be the fear of failure, which could seriously tarnish the image of independent individuals. This is why we think that it is worth to begin working with these pupils from building elements of creative identity. Sometimes, it is enough to indicate the current results of their creative activities and emphasize their value, cost-effectiveness, and benefits. However, activities that aim at realizing the potential of these pupils are usually a long process of building appropriate motivational orientations (it is unfortunately usually longer than stimulation of the development of the cognitive aspects of creativity).

Working with pupils characterized by the subordinate creativity profile (with high level of conformism), teachers should emphasize the element of "being creatively against," which includes alternative views and courage of proposing changes. It is of course not about encouraging destructive resistance, but reformist discord that expresses itself in autonomy, ability to make independent decisions, and sense of agency. This is where another question arises, however: How to encourage subordinate pupils to question

the status quo? Apparently, it is worth to attract their attention to issues they find important and worth getting involved in. Subjective importance of the confronted problem may alleviate their internal emphasis of acceptance and "obedient" acceptance and, consequently, encourage a creative search for changes. It is often also worth to impose on them the role of group leaders in certain tasks in order to weaken their conformism and warm them up to taking risky decisions. Certainly, sensing the right moment to change the support strategy and support progressive expansion of the space for their independence in such a way that their developing independence aims at posing questions and discovering new problems is the most difficult thing while working with pupils characterized by subordinate creativity.

Putting Theory into Practice

Probably the most important practical questions that stem from this chapter are those that stress practical consequences of the typology we proposed, namely: How to develop students' creativity at school if it can have very different profiles? How to individualize stimulating activities? What level of support to provide in order to increase the probability of reforging the students' potential into tangible future creative achievements?

Individualization of activities that develop creativity during classes is a constant challenge for creative education. The typological approach we described was already applied, while conducting a unique creativity training known as "Creativity Compass" (Dziedziewicz, Gajda, & Karwowski, 2014; Jankowska, Gajda, & Karwowski, 2015).

The Creativity Compass program is directed at teachers who work with children aged 6–12 – especially those who are interested in developing creativity and who search for practical tools that become useful when discussing multicultural issues. Among other things, its purpose is to stimulate the development of creative abilities, openness, and independence, which foster dealing with new and poorly defined situations. The activities in this program are of a fictionalized character – their leitmotif is mentally traveling to different countries, towns, and regions. The activities in this program are grouped into three stages. The first one (interest) aims at initiating the topic and encouraging children to undertake creative activity. It usually has the form of an open question that builds the climate of curiosity and openness and encourages children to formulate their own opinions and judgments (e.g., "Why do cats on the Isle of Man have no tails?"). Additionally, this stage is also a creative warm-up that stimulates the development of divergent thinking and creative imagination. Then

comes the group work or pair work stage (searching), which refers to such thematic threads as the history of a given country, its legends and tales, culture, traditions and customs, national symbols, monuments, and tourist attractions. Thanks to the initial assessment of creativity profiles, in this stage the teacher can organize group work in a way that maximizes the potential of peer tutoring. Thus, the teacher does not consider natural differences in the various aspects of creative potential as barriers in effecting the program, but as good conditions to design an educational situation in which students can become creativity tutors for one another. And so, to provide an example, learning cooperation between a student profiled as showing self-actualizing creativity with his or her peer profiled as exhibiting subordinate creativity may prevent senseless destruction and, instead, develop openness in the former child while teaching the latter how to take risks and trigger independence. In this form of cooperation, the teacher's role should be to discreetly monitor tutoring for students to feel secure in both roles (the tutor and the tutored). At the end of each meeting of the Creativity Compass program, there comes the stage of exploration, which is a reflective summary of the knowledge gained about other cultural circles during the previous activities. The example of this program shows that multifaceted (i.e., cognitive, personality-related, and motivational) stimulation of creativity makes it possible to stimulate various types of creativity while creating space for the individualization of training activities (Dziedziewicz et al., 2014; Jankowska et al., 2015).

An important consequence that stems from the observed differences between the types is the significance of the role of social factors in the fostering of creativity. The importance of socializing and educational space and, most of all, parental attitudes is enormous, and it is these elements that significantly influence whether the student that a given teacher works with will be classified as belonging to the complex creativity or subordinate creativity group.

Perseverance and motivation are as important as the attitudes that stimulate the family environment. When dealing with motivation, it is worth considering not just a conviction about the role of intrinsic motivation but also the possibility of synergetic interaction between intrinsic and extrinsic motivations. With regard to creative attitude, the hypothesis of motivational synergy, posed by Amabile (1993, 1997) and confirmed in other studies (Karwowski & Gralewski, 2011), assumes that extrinsic motivation may be positively related to creativity, but only when intrinsic motivation is high. It is then that synergetic cooperation between the two types of motivation occurs. Amabile (1993) offers detailed mechanisms that fuel

synergetic and nonsynergetic extrinsic motivation and indicates how the climate of the surroundings can stimulate both synergetic and nonsynergetic types of extrinsic motivation (Amabile, 1997).

The "creative self-efficacy – identity – values" triad is another important element that makes it possible to reforge creative potential into achievements and differentiates the creativity types. Actual creativity is impossible without the individual having a sense of being actually capable of it and without this person's high valuation of creativity. Creative self-efficacy mediates the relations between creative abilities and creative achievements (Chen, in press; Karwowski & Barbot, 2016; Karwowski & Lebuda, in press), whereby individuals who are more creative are also more aware of their strengths, which translates into their achievements (Tierney & Farmer, 2011). Jaussi, Randel, and Dionne (2007) propose to analyze not just creative self-efficacy but also the place creativity occupies in the overall system of personal identity (see also Karwowski, 2012; Karwowski, Lebuda, Wiśniewska, & Gralewski, 2013). What is important is not just whether individuals consider themselves to be a creative but also whether and to what extent it is important for them. When one is creative and considers oneself as such, and when this is at the same time very important for him or her, then chances for involvement in creative activities and for succeeding in them increase (see Helson & Pals, 2000).

Certainly, the elements mentioned above are just selected factors that foster creative achievements. Longitudinal studies of the relations between creative potential and creative achievements (Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005; Feist & Barron, 2003; Helson & Pals, 2000; Plucker, 1999; Runco, 1999) provide a large number of predictors, mediators, and moderators of outstanding success in creativity, located at various levels of analysis and constantly interacting.

Conclusion

The typological approach to students' creativity stems from a rich tradition of similar theories – from Kirton's (1976) adaption-innovation theory to Galenson's (2011) finders and seekers. Thus, we concur with the underlying assumption that it is worthwhile to ask not only "How much creative abilities do you have?" but also "What is your style of creativity?" At the same time, however, we do believe that one continuum is unable to fully cover the richness of creativity; it does not matter whether we are talking about adaptors and innovators, finders and seekers, or any other dichotomy (Glăveanu, 2015). Instead of another one-dimensional

theory, we propose a typological model of creativity, with four distinct types, characterized by clearly different profiles (see Sternberg, Kaufman, & Pretz, 2002, for an even more complex approach). People with high creative abilities, openness, and independence represent the "complex creativity" type, but they are rare. On the other hand, teachers often perceive creativity negatively (Westby & Dawson, 1995) – likely because they tend to focus on the type we described as "rebellious creativity." The people of this creative type – highly talented or original and nonconformist but not very open – are clearly salient in the class, but usually not very productive. This category of creative rebels is not very welcome at school (Karwowski, 2010b), but they sometimes revolutionize the field they explore. Quite the opposite type was labeled as representing "subordinate creativity" – as having a clear profile of high openness and creative abilities combined with high conformity. Such people are "good students" (Karwowski, 2010b, in press) and are conceptually close to Kirton's (1976) adaptors. They function well at school, are well adapted, and coexist with their peers effectively. The question is whether they will be able to persuade others that their creative ideas are worth implementing while dealing with real-life problems. Perhaps the most interesting category is the one we called "self-actualizing creativity" – people who are highly open and nonconformist while having relatively low creative abilities. Their personality profile fits almost perfectly into the classic descriptions of "creative personality" in early works of humanistic psychology (Fromm, 1959; Maslow, 1959). Such a profile may suggest "scribbler's creativity" or "creative potential without chances for real achievement" (Nicholls, 1972). However, there are dozens of proofs that creative abilities are quite easily developed and that creativity trainings are very effective (Dziedziewicz et al., 2013, 2014; Karwowski & Soszyński, 2008; Scott et al., 2004). Therefore, low initial creative abilities are not necessarily a problem – in fact, it is just a matter of practice to develop them.

The typological model of creativity stems from two different streams of research on creativity presented in the creativity literature. The first one focuses on the characteristics of creative people, exploring the rich complexity and domain-specificity of their characteristics (Baer, 2014; Feist, 1998). The second one stems from studies on teachers' implicit theories of creativity as well as common misunderstandings and biases found among teachers (e.g., Gralewski & Karwowski, 2013, 2016; Karwowski, 2007; Scott, 1999). We do believe that teachers usually define creativity by focusing only on its certain aspects and, consequently, having an incomplete picture of creative students.

Several consequences of the typological theory of creativity seem important. We need not only to develop valid and reliable measures of creativity types (works on this are in progress) but also to fully understand the school functioning of different types and the most efficient ways of stimulating their creativity, as it is very likely that "typical" creativity training is not equally effective for all types. It is also of special importance to understand how individuals representing different types cooperate while learning or solving ill-defined problems and to provide teachers with guidance on how to lead them most effectively. Future works should resolve these issues and shed some lights on our understanding of different types of creativity.

Authors' Note and Acknowledgment

REFERENCES

Amabile, T. M. (1993). Motivational synergy: Toward new conceptualizations of intrinsic and extrinsic motivation in the workplace. *Human Resource Management Review*, **3**, 185–201.

Amabile, T. M. (1997). Entrepreneurial creativity through motivational synergy. *Journal of Creative Behavior*, **31**, 18–26.

Andiliou, A., & Murphy, P. K. (2010). Examining variations among researchers' and teachers' conceptualizations of creativity: A review and synthesis of contemporary research. *Educational Research Review*, **5**, 201–219.

Baer, J. (2014). The crisis in creativity research stems from too little fragmentation, not too much. *Creativity: Theories – Research – Applications*, **2**, 200–205.

Beghetto, R. A. (2006). Creative self-efficacy: Correlates in middle and secondary students. *Creativity Research Journal*, **18**, 447–457.

Beghetto, R. A. (2016). Creative learning: A fresh look. *Journal of Cognitive Education and Psychology*, 15, 6–23.

Chan, D. W., & Chan, L. (1999). Implicit theories of creativity: Teachers' perception of students characteristics in Hog-Kong. *Creativity Research Journal*, **12**, 185–195.

Cramond, B., Matthews-Morgan, J., Bandalos, D., & Zuo, L. (2005). A report on the 40-year follow-up of the Torrance Tests of Creative Thinking. *Gifted Child Quarterly*, **49**, 283–291.

Chen, B. B. (in press). The creative self-concept as a mediator between openness to experience and creative behaviour. *Creativity: Theories-Research-Applications*.

Dweck, C. (2006). *Mindset: The new psychology of success*. New York: Random House.

Dziedziewicz, D., Gajda, A., & Karwowski, M. (2014). Developing intercultural competence and creativity. *Thinking Skills and Creativity*, **13**, 32–42.

Dziedziewicz, D., & Karwowski, M. (2015). Development of children's creative visual imagination: A theoretical model and enhancement programmes. *Education 3–13*. doi:10.1080/03004279.2015.1020646

Dziedziewicz, D., Olędzka, D., & Karwowski, M. (2013). Developing 4- to 6-year-old children's figural creativity using a doodle-book program. *Thinking Skills and Creativity*, **9**, 85–95.

Feist, G. J. (1998). A meta-analysis of personality in scientific and artistic creativity. *Personality and Social Psychology Review*, **2**, 290–309.

Feist, G. J., & Barron, F. X. (2003). Predicting creativity from early to late adulthood: Intellect potential, and personality. *Journal of Research in Personality*, **37**, 62–88.

Feist, G. J., & Brady, T. R. (2004). Openness to experience, non-conformity, and the preference for abstract art. *Empirical Studies of the Arts*, **22**, 77–89.

Fromm, E. (1959). The creative attitude. In H. H. Anderson (Eds.), *Creativity and its cultivation* (pp. 44–54). New York: Harper & Brothers.

Gajda, A., Karwowski, M., & Beghetto (in press). Creativity and academic achievement: A meta-analysis. *Journal of Educational Psychology*, http://dx.doi.org/10.1037/edu0000133.

Galenson, D. W. (2011). *Old masters and young geniuses: The two life cycles of artistic creativity*. Princeton, NJ: Princeton University Press.

Glăveanu, V. P. (2015). The status of the social in creativity studies and the pitfalls of dichotomic thinking. *Creativity: Theories – Research – Applications*, 2, 94–111.

Gralewski, J., & Karwowski, M. (2013). Polite girls and creative boys? Students' gender moderates accuracy of teachers' ratings of creativity. *Journal of Creative Behavior*, **47**, 290–304.

Gralewski, J., & Karwowski, M. (2016). Are teachers' implicit theories of creativity related to the recognition of their students' creativity? *Journal of Creative Behavior*, doi: 10.1002/jocb.140.

Helson, R., & Pals, J. L. (2000). Creativity potential, creative achievement, and personal growth. *Journal of Personality*, **68**, 1–27.

Jankowska, D. M., Gajda, A., & Karwowski, M. (2015). How to develop children's creativity and intercultural sensitivity: Around Creativity Compass program. In A. G. Tan & C. Perleth (Eds.), *Creativity, culture, and development* (pp. 133–147). Singapore: Springer.

Jankowska, D. M., & Karwowski, M. (2015). Measuring creative imagery abilities. *Frontiers in Psychology,* 6, 1591, http://doi.org/10.3389/fpsyg.2015.01591.

Jaussi, K. S, Randel, A. E., & Dionne, S. D. (2007). I am, I think I can, and I do: The role of personal identity, self-efficacy, and cross-application of experiences in creativity at work. *Creativity Research Journal*, **19**, 247–258.

Jellen, H. G., & Urban, K. K. (1989). Assessing creative potential worldwide: The first cross-cultural application of the test for creative thinking-drawing production (TCT-DP). *Gifted Education International*, **6**, 78–86.

Karwowski, M. (2007). Teachers' nominations of students' creativity: Should we believe them? Are the nominations valid? *Social Sciences*, **2**, 264–269.

Karwowski, M. (2010a). Kreatywność – feeria rozumień, uwikłań, powodów. Teoretyczno-empiryczna prolegomena. [Creativity: a feeria of understandings, entanglements, conditions]. In. M. Karwowski & A. Gajda (Eds.), *Kreatywność (nie tylko) w klasie szkolnej* [Creativity not only in the classroom] (pp. 12–45). Warszawa: Wydawnictwo Akademii Pedagogiki Specjalnej.

Karwowski, M. (2010b). Are creative students really welcome in the classroom? Implicit theories of "good" and "creative" student' personality among Polish teachers. *Social and Behavioural Sciences Journal*, **2**, 1233–1237.

Karwowski, M. (2012). Did curiosity kill the cat? Relationship between trait curiosity, creative self-efficacy and creative personal identity. *Europe's Journal of Psychology*, **8**, 547–558.

Karwowski, M. (2014). Creative mindset: Measurement, correlates, consequences. *Psychology of Aesthetics, Creativity, and the Arts*, **8**, 62–70.

Karwowski, M. (2015a). Notes on creative potential and its measurement. *Creativity: Theories – Research – Applications*, **2**, 4–17.

Karwowski, M. (2015b). Types of creativity questionnaire. Unpublished manuscript.

Karwowski, M. (in press). Subordinated and rebellious creativity at school. In R. A. Beghetto & B. Sriraman (Eds.), *Creative contradictions in education: Cross disciplinary paradoxes and perspectives*. Dordrecht, The Netherlands: Springer.

Karwowski, M. & Barbot, B. (2016). Creative self-beliefs: Their nature, development, and correlates. In J. C. Kaufman & J. Baer (Eds.), *Cambridge companion to reason and development* (pp. 302–326). New York: Cambridge University Press.

Karwowski, M., Dul, J., Gralewski, J., Jauk, E., Jankowska, D. M., Gajda, A., & Benedek, M. (2016). Intelligence as the necessary condition for creativity? Beyond the threshold hypothesis. *Intelligence*, **57**, 105–117.

Karwowski, M., & Gralewski, J. (2011). Zmotywowana kreatywność. Synergia motywacyjna postawy twórczej młodzieży. [Motivated creativity. Motivational synergy of youths' creative attitude]. *Chowanna*, **2**, 45–58.

Karwowski, M., & Gralewski, J. (2013). Threshold hypothesis: Fact or artifact? *Thinking Skills and Creativity*, **8**, 25–33.

Karwowski, M., & Lebuda, I. (2016). The big five, the huge two and creative self-beliefs: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts*, 10, 214–232.

Karwowski, M., & Lebuda, I. (in press). Creative self-concept: A surface characteristic of creative personality. In G. Feist, R. Reiter-Palmon, & J. C. Kaufman (Eds.), *Cambridge handbook of creativity and personality research*. New York: Cambridge University Press.

Karwowski, M., Lebuda, I., Wisniewska, E., & Gralewski, J. (2013). Big Five personality factors as the predictors of creative self-efficacy and creative personal identity: Does gender matter. *Journal of Creative Behavior*, **47**, 215–232.

Karwowski, M., & Soszyński, M. (2008). How to develop creative imagination? *Thinking Skills and Creativity*, **3**, 163–171.

Kaufman, J. C. (2009). *Creativity 101*. New York: Springer.

Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The four C model of creativity. *Review of General Psychology*, **13**, 1–12.

Kirton, M. J. (1976). Adaptors and innovators: A description and measure. *Journal of Applied Psychology*, **61**, 622–629.

Lubart, T., Zenasni, F., & Barbot, B. (2013). Creative potential and its measurement. *International Journal for Talent Development and Creativity*, **1**, 41–51.

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, **101**, 847–861.

Maslow, A. (1959). Creativity in self-actualizing people. In. H. H. Anderson (Ed.), *Creativity and its cultivation* (pp. 83–95). New York: Harper & Brothers.

McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*, **52**(6), 1258–1265.

Nicholls, J. G. (1972). Creativity in the person who will never produce anything original and useful: The concept of creativity as a normally distributed trait. *American Psychologist*, **27**, 717–727.

Plucker, J. (1999). Is the proof in the pudding? Reanalyses of Torrance's (1958 to present) longitudinal study data. *Creativity Research Journal*, **12**, 103–114.

Plucker, J. A., Beghetto, R. A., & Dow, G. T. (2004). Why isn't creativity more important to educational psychologists? Potentials, pitfalls, and future directions in creativity research. *Educational Psychologist*, **39**, 83–96.

Prabhu, V., Sutton, C., & Sauser, W. (2008). Creativity and certain personality traits: Understanding the mediating effect of intrinsic motivation. *Creativity Research Journal*, **20**, 53–66.

Runco, M. A. (1999). A longitudinal study of exceptional giftedness and creativity. *Creativity Research Journal*, **12**, 161–164.

Runco, M. A. (2015). A commentary on the social perspective on creativity. *Creativity: Theories – Research – Applications*, **2**, 21–32.

Scott, C. L. (1999). Teachers' biases toward creative children. *Creativity Research Journal*, **12**, 321–328.

Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal*, **16**, 361–388.

Silvia, P. J., Nusbaum, E. C., Berg, C., Martin, C., & O'Connor, A. (2009). Openness to experience, plasticity, and creativity: Exploring lower-order, higher-order, and interactive effects. *Journal of Research in Personality*, **43**, 1087–1090.

Simonton, D. K. (2009). Varieties of (scientific) creativity: A hierarchical model of domain-specific disposition, development, and achievement. *Perspectives on Psychological Science*, **4**, 441–452.

Sternberg, R. J., Kaufman, J. C., & Pretz, J. E. (2002). *The creativity conundrum: A propulsion model of kinds of creative contributions.* New York: Psychology Press.

Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity.* New York: Free Press.

Tierney, P., & Farmer, S. M. (2011). Creative self-efficacy development and creative performance over time. *Journal of Applied Psychology*, **96**(2), 277–293.

Urban, K. K. (2005). Assessing creativity: The test for creative thinking – drawing production (TCT-DP). *International Education Journal*, **6**, 272–280.

Voss, J. F., & Means, M. L. (1989). Toward a model of creativity based upon problem solving in the social sciences. In J. A. Glover, R. R. Ronning, & C. R. Ronning (Eds.), *Handbook of creativity* (pp. 399–410). New York: Plenum Press.

Westby, E. L., & Dawson, V. L. (1995). Creativity: Asset or burden in the classroom? *Creativity Research Journal*, **8**, 1–10.