The Effect of Creativity Training on Creative Self-Efficacy and the Moderating Role of

Openness to Experience

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Abstract

Creativity is the most valuable resource in the 21st century as it plays a role in outstanding achievements in sciences, entrepreneurial activities, innovation and economic long-term growth. No wonder that a variety of creativity trainings are offered throughout all kinds of professions in order to increase one's creative performance. Nonetheless, previous research points into different directions about the reasons why creativity training influences creativity, or what extend of training and guidance is needed to see an effect. Creative self-efficacy might be a valuable option as the reason behind it, given the fact that creative self-efficacy is a key predictor for creative behavior and has previously been shown to be enhanced by creativity training. Further, openness to experience might be a moderator of this relationship, given the fact that it is conceptualized as the key trait underlying creativity. In this paper, it will be investigated how the amount of training and guidance influences the creative self-efficacy of participants and if this relationship is moderated by openness to experience. A quasi-experiment ($N = 126$) with three different creativity trainings condition (i.e., professional creativity training, creativity instructions, no creativity instruction) investigated this relationship. Results of the study showed a significant positive relationship between professional creativity training and creative self-efficacy. Even though no interaction effect between openness to experience and the creativity trainings condition with creative self-efficacy was found, a negative moderation effect of age was found for the professional creativity trainings condition. We concluded that professional creativity training is effective to increase one's creative self-efficacy, especially when participants are of younger age. Theoretical and practical implications are discussed.

Keywords: creativity, creativity training, creative self-efficacy, openness to experience, personality traits

The Effect of Creativity Training on Creative Self-Efficacy and the Moderating Role of Openness to Experience

"Creativity is the force behind all human progress" (Cseh, 2016, p. 81). This statement might be bold but seems to hold when looked closer at. Creativity is everywhere. For instance, creativity is related to outstanding achievements in arts as well as sciences (Feist & Gorman, 1998; Kaufmann, 2003; Mackinnon, 1962) and plays an important role in the development of new and leading extant social institutions (Mumford, 2002). Moreover, creativity seems to provide monetary incentives through its relationship to entrepreneurial activities and economic long-term growth (Amabile, 1997; Simonton, 1998) and has been linked to the overall well-being and adaptation to the demands of daily life of people (Cropley, 1990; Reiter-Palmon et al., 1998).

Overall, creativity has been described as the most important economic resource of the 21st century (Florida, 2002). This possibly explains why people try to foster creativity through different forms of training. A meta-analysis of over 70 studies showed the promising results that creativity training works, if it is well-designed. This is the case when aspects and processes linked to the idea generation, problem finding or conceptual combining are included (Scott et al., 2004). Even though the effect of creativity training on creativity is undeniable, the reasons and underlying mechanisms for this relationship are exactly not know yet.

Further, up to this point and despite numerous research done in this domain, not much is known about what factors that make a to person express creativity and engage in creative behavior. While there is no explicit and common definition of all shades of creativity and what it consists of (Sternberg, 2006), people often only consider creative geniuses and creators whose work lasts forever, as creative, also called Big C creativity (Simonton 1994). Consequently, it is difficult for people to live up to these standards. This negatively influences a person's sense of efficacy, the belief of being able to perform certain tasks (Bandura, 1997),

which is not only important for someone's well-being, but also for the perspective of seeing difficult tasks rather as challenges to face than obstacles to avoid (Bandura, 1997). As a consequence, people are less motivated to perform these actions e.g., engaging in creative tasks, generating novel ideas or giving themselves space for creative solutions (Bandura, 1986; Wood & Bandura 1989). In that case, people do not consider some shades of creativity and ignore their capabilities to perform day-to-day creative activities like combining different kinds of foods or arranging photos, which is also called Little c creativity (Richards, 1990).

This points into the direction that creativity training might increase people's ability and willingness to engage in creative tasks and processes through enhancing an individual's creative self-efficacy. Creative self-efficacy is one's belief in their own ability and potential to generate novel and useful ideas, as well as produce creative outcomes in general (Karwowski, 2011; Tierney & Farmer, 2004) and has been to be related to creative performance (Carmeli & Schaubroeck, 2007; Choi, 2004; Schack, 1989; Tierney & Farmer, 2002, 2004). Overall, creative self-efficacy is a key determent of whether an individual will approach or avoid a creative task (Christensen-Salem et al., 2020). In the past, the connection of enabling people to be more creative by enhancing their creative self-efficacy with creativity training was already suggested by parts of the theory (Mathisen & Bronnick, 2009; Tang & Werner, 2017). Unfortunately, only a couple of studies have examined the effects creativity training has on creative self-efficacy (Gist, 1989; Locke et al., 1984; Mathisen & Bronnick, 2009), and studies about how exactly creativity training affects a participant's creative self-efficacy are still rare (Meinel et al., 2019). In this paper, I will investigate the expected positive effect of creativity training on creative self-efficacy. This will give more insights about how to increase people's confidence in their creative abilities and consequently, enable them to express those abilities easier.

Furthermore, a Variety of studies have indicated a correlation between specific personality traits and creativity (Batey & Furnham, 2006; Feist, 1998). As a result, openness to experience has been conceptualized as the core trait underlying creativity (McCrae, 1987), since it showed the most consistent relationship with creativity (Kandler et al., 2016). Accordingly, the moderating effect of openness to experience on the potential relationship between creativity training and creative self-efficacy will be investigated.

Literature Review

Professional Creativity Training

Creativity training is omnipresent. It is offered through all levels of education, from kindergarten (Meador, 1995) to college (Daniels et al., 1985; Glover, 1980), and for all kinds of students or athletes (Kovac, 1998). Further, it is often a key component of educational programs for the talented, seemingly offering an advantage for life (Flack, 1995; Kay, 1998). Regardless of the exact techniques or duration of the training, a meta-analysis based on 70 studies found that creativity training programs, if well-designed, including aspects like and processes linked to the idea generation, problem finding or conceptual combining, result in enhanced creative performance across different criteria, settings, and target populations (Scott et al., 2004). The duration of such training can reach from less than one hour (Clapham, 1997) up to multiple semesters (Reese et al., 1976) and can put great emphasis on different techniques like presentations and discussions (Fontenot, 1993) or guided practices (Warren & Davis, 1969).

Nonetheless, the exact reasons for why creativity training works are not known yet and a variety of options might be possible. For instance, creative activities can be considered as conscious cognitive process and, consequently, can be learned by everyone, when trained (Allen & Thomas, 2011). In addition, it could be that solely the encouragement of engaging in creative tasks has a positive impact on creativity (Puente-Díaz & Cavazos-Arroyo, 2017) or

that an evaluation (e.g., through an instructor) is beneficial for one's creativity (Perkins, 1981). Overall, a variety of possibilities when and why professional creativity training might be successful are proposed. Nonetheless, research also indicates that solely creativity instructions could be already enough to influence a person's creativity positively.

Creativity Instructions

A variety of studies showed that when participants received solely the instructions to "be creative", they would produce more creative ideas in quantity (i.e., how many in total), as well as quality (i.e., in means of novelty of the idea) (Christensen et al., 1960; Wilson et al., 1953). Further studies showed that if those instructions are more explicit and elaborating more in detail how to be creative, the effect on creativity and creative outcomes is even bigger (Chen et al., 2002; Chen et al., 2005; Niu & Liu, 2009). This is in line with research showing that receiving brainstorming instructions enhances the creativity and production of ideas (Parnes & Meadow, 1959), since brainstorming should counter premature evaluation of ideas which often inhibits not only the generation but also the presentation of ideas (Osborn, 1957). In fact, one possibility of why professional creativity training as well as receiving creativity instructions seem to enhance someone's creativity might be because both increase an individual's creative self-efficacy and as a consequent people's ability and willingness to engage in creative tasks and processes. Especially, because creative self-efficacy may be an important factor stimulating someone's motivation and striving to engage in a creative task (Bandura, 1986; Wood & Bandura 1989; Christensen-Salem et al., 2020).

Creative Self-Efficacy

Creative self-efficacy is the belief one has in their own ability and potential to generate novel and useful ideas, as well as produce creative outcomes in general (Karwowski, 2011; Tierney & Farmer, 2004). It stems from the more general self-efficacy, which is a person's belief that they can successfully perform in a particular setting (Bandura, 1997).

Bandura recognized early a likely relationship between self-efficacy and creative performance (1997). This hypothesis is supported by a variety of studies showing that creative self-efficacy is related to creative performance (Carmeli & Schaubroeck, 2007; Choi, 2004; Schack, 1989; Tierney & Farmer, 2002, 2004). Overall, creative self-efficacy is shown to be a positive predictor of creative behaviors like the initiation of independent projects, and thinking patterns like reproductive imagination (i.e., being able to reproduce or imitate behavior) and creative imagination (i.e., combine things in a way that has not been experienced before) (Puente-Díaz & Cavazos-Arroyo, 2017; Schack, 1989). Moreover, those effects were shown and consistent across different methods like self-reports, test scores as well as observed and reported by a third party (Carmeli & Schaubroeck, 2007; Choi, 2004; Tierney & Farmer, 2002, 2004).

Not only is a strong relationship between creativity and creative self-efficacy given, studies also have indicated that creativity training might be able to increase the participants' creative self-efficacy (Mathisen & Bronnick, 2009; Tang & Werner, 2017). Generally, self-efficacy, as well as creative self-efficacy, are best achieved by developing knowledge, rules, and strategies in combination with getting assured about one's capability to use these strategies (Locke et al., 1984; Schunk & Rice, 1987). Thus, creativity training combining lectures, practicing brainstorming and cognitive modeling should be the most effective (Gist, 1989). While lectures are only present in professional creativity training, practicing brainstorming and cognitive modeling, which is to give examples and demonstrations of thought patterns that correspond with the provided brainstorming guidelines, can also be present when receiving creativity instructions, hence, should be also somewhat effective (see Figure 1). This explains why tasks involving these kinds of creativity instructions (i.e., brainstorming guidelines, instructions to execute brainstorming) like design thinking, which is a human-centered creative thinking method (Melles et al., 2012), have shown to increase a

person's creative self-efficacy (Yang & Hsu, 2020). Nonetheless, the extent to which all those aspects have to be included to be effective in increasing someone's self-efficacy still remains unanswered. An urge to investigate how to improve someone's creative self-efficacy the most efficient, with the given resources, to enable more people to reach their full creative potential is present. That way, professional creativity training can be tailored to the participants need, stressing the most valuable insights to generate a higher creative self-efficacy (e.g., lectures, cognitive modeling, providing strategies or guidance through creativity exercises). Additionally, if resources like time, money or availability of professional creativity training are not given, creativity instructions (i.e., the supply with brainstorming rules or engaging in creative tasks) could be a useful first step for improving someone's creative self-efficacy.

Figure 1

The Theoretical Model I
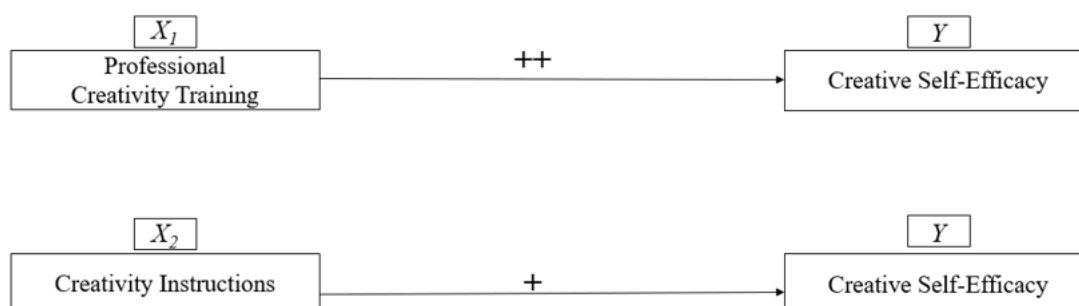
Note. The first part of the theoretical model. The effect of creativity training (X), either professional creativity training (X_1) or creativity instructions (X_2), on creative self-efficacy (Y).

Nevertheless, some studies found no effect of creativity training on creative self-efficacy at all (Meinel et al., 2019; Starkey et al., 2017) or indicated that the found results could be explained by the Hawthorne effect, which is that participants solely perform better because they are observed rather than because the intervention works. The reason for this is

that some studies indicating an improvement in creative self-efficacy through creativity training did not use a control group to compare with (Mathisen & Bronnick, 2009). Finally, only a couple of studies have examined the effects creativity training has on creative self-efficacy at all (Gist, 1989; Locke et al., 1984; Mathisen & Bronnick, 2009). Additionally, when conducted, these studies only compared similar kinds of creativity training, which only differed in one aspect (e.g., duration or an additional exercise) rather than completely different approaches (e.g., professional creativity training, only creativity instructions, no creativity instructions). Overall, studies about how exactly creativity training affects an individual's creative self-efficacy are still rare (Meinel et al., 2019).

As a result of the strong relationship indicated by theory, yet, contradicting findings in studies and the urgent call for more research to be done in this field of creativity research, this paper aims to shed light on the question of what effect creativity training will have on creative self-efficacy and to what extent this depends on the level of creativity training and guidance the participants receive (i.e., professional creativity training, only creativity instructions, and no creativity instructions). To do so, the following hypotheses will be investigated.

Hypothesis 1. Participants with professional creativity training opposed to participants no creativity instructions, will show the highest increase in creative self-efficacy over a span of two weeks.

Hypothesis 2. Participants who receive only creativity instructions as opposed to participants without any creativity instructions will show a higher increase in creative self-efficacy over a span of two weeks, but a lower increase in creative self-efficacy in comparison to participants receiving a professional creativity training.

Moderating Role of Openness to Experience

Research indicated that creativity and engaging in creative tasks may be combining a diversity of individual differences like cognitive flexibility, capacity, efficient utilization of

knowledge, openness to experience and more (Kandler et al., 2016). Already in the beginning

of creativity research, the role of personality traits as well as intelligence have been

emphasized by many researchers (Barron & Harrington, 1981; Guilford, 1950; Simonton,

2014) and a variety of studies found a correlation between specific personality traits and

creativity (Batey & Furnham, 2006; Feist, 1998). Overall, openness to experience shows

relatively stable patterns of typical thinking, feeling, and acting linked to creativity (Kandler

et al., 2016). Specifically, openness to experience is characterized by breadth, depth and

consciousness in mental processes. It also involves curiosity as well as the continuous need

for novelty and for new ideas from oneself and others to gain knowledge and expertise

(Denissen & Penke, 2008; Goldberg, 1993; McCrae & Costa, 1997).

Moreover, openness to experience has been conceptualized as the core trait underlying

creativity (McCrae, 1987). In fact, the relationship between openness to experience and

creativity is the most consistent amongst all other personality traits (Kandler et al., 2016). To

illustrate, openness to experience and creativity showed a strong correlation regardless if in a

longitudinal study over a period of 45 years ($r=.40$) (Soldz & Vaillant, 1999) or a variety of

other studies with different samples and operationalizations of creativity (between $r = 0.20$ &

$r = 0.50$) (Furnham & Bachtiar, 2008; King et al., 1996; McCrae, 1987; Silvia et al., 2009).

Further, tolerance of ambiguity, which is often related to people with high openness to

experience, is a common personality variable of creative people (Comadena, 1984; Merrotsy,

2013; Zenasni et al., 2008). Hence, this paper will focus on how openness to experience

moderates the relationship between the level of creativity training and creative self-efficacy.

While a moderating effect of openness to experience between creativity training and

creative self-efficacy is suggested given the above, the direction cannot clearly be stated. On

the one hand, high openness to experience was shown to be a key determent for the

motivation to learn (Major et al., 2006) as well as stating a training (Godlewska-Werner et al.,

2014). Likewise, it positively influences the receptivity to the creativity training which facilitates the usage of the learned techniques, and hence, the increase in creative self-efficacy (see Figure 2a). On the other hand, openness to experience can be found as a positive predictor for creative self-efficacy (Karwowski et al., 2013) and creative performance (Gocłowska et al., 2018), indicating that people with high openness to experience tend to have a higher baseline creative self-efficacy and creative performance. In line with the research of Meinel and colleagues (2019), which presents that the higher the baseline creative performance, the lower the trainings effects, it could be argued that high openness to experience would negatively influence the relationship between creativity training and creative self-efficacy (see Figure 2b). As a result of this unpredictable direction of the moderating effect, this paper will investigate two competing hypotheses.

Hypothesis 3a. People higher in openness to experience as opposed to those lower in openness to experience, will display a higher learning effect of the creativity training, resulting in a higher increase of their creative self-efficacy.

Hypothesis 3b. People high in openness to experience as opposed to those lower in openness to experience, will display a lower learning effect of the creativity training, resulting in a lower increase of their creative self-efficacy.

Figure 2a

The Theoretical Model II
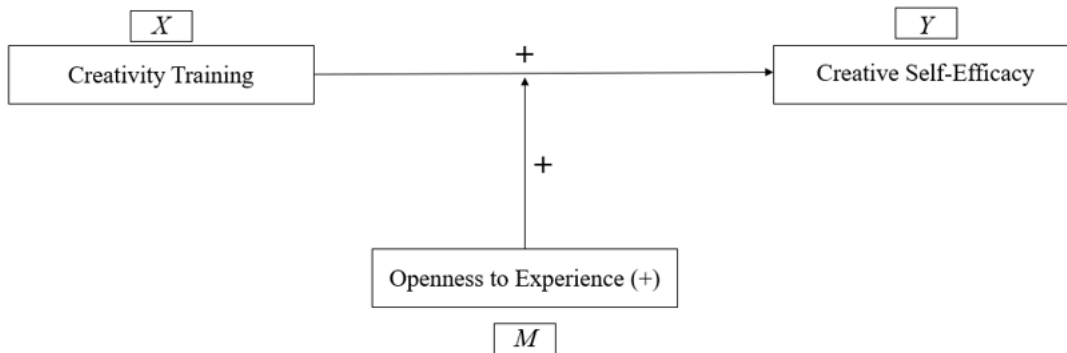
X		Y
Creativity Training	+	Creative Self-Efficacy

+

Openness to Experience (+)
M

Note. One option of the full theoretical model. The effect of creativity training (X) on creative self-efficacy (Y) moderated by high openness to experience (M).

Figure 2b

The Theoretical Model III
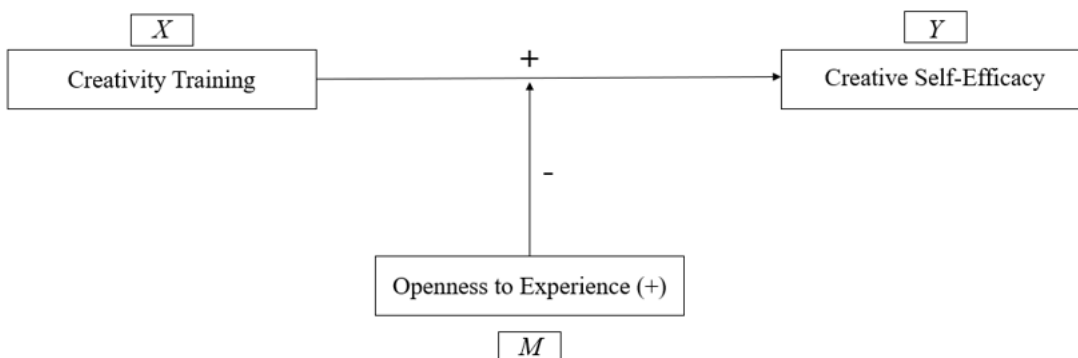
X		Y
Creativity Training	+	Creative Self-Efficacy

-

Openness to Experience (+)
M

Note. One option of the full theoretical model. The effect of creativity training (X) on creative self-efficacy (Y) moderated by high openness to experience (M).

Method

Participants

A total number of 126 participants took part in the quasi-experiment. 14 participants were participating in the professional creativity training (9 females, 5 males, M_{age} = 25.50, *SD* = 3.55), 60 participants (47 females, 11 males, 2 unknown, M_{age} = 29.10, SD = 3.95) were in

the creativity instructions condition and 52 participants (38 females, 12 males, 2 unknown, M_{age} = 30.15, SD = 3.80) were participating in the condition without creativity instructions. The participants have over 10 different countries of origin (e.g., United Kingdom, Germany, Spain, etc.). The majority of participant in the creativity instruction condition (87%) and the condition without creativity instruction (79%) were from the UK, while the majority of participants in the professional creativity training were from Germany (21%) and Spain (21%) (see Appendix A for exact distributions of participants). Generally, participants for the creativity instruction condition and the condition without creativity instruction were approached via an online paid participant pool. To have a sample relatively similar to the creativity training group, people were invited if they possessed an academic background of a Bachelor's degree, or an equivalent level, and upwards. Despite the pre-set filters in regards of the previous education, one participant noted a High School diploma as their highest form of education. Lastly, the current country of residence for the participants of the creativity instructions condition and in the condition without any creativity training should be the United Kingdom or the United States and their age range was limited to 18 – 35 years.

The majority of all participants obtained an undergraduate degree as highest form of education. In descending numbers, participants had a postgraduate or Ph.D. degree as highest form of education (see Appendix B for exact distribution). The participants of the professional creativity training were current postgraduate (N=11) or Ph.D. students (N=3) from different fields of studies (e.g., physics, law, international relations), while the participants of the creativity instruction condition or condition without any creativity instructions were mainly non-students from different fields of profession (e.g., finances, law, education). Lastly, according to a prior power analysis for our design, 55 participants per condition are required to observe a medium effect size (*Cohen's f*=.15) and have a power of 80%.

Research Design and Procedure

The study is a quasi-experiment with a within-subject design (pre-test / post-test). The three different conditions differed in the amount of creativity training and guidance provided (professional creativity training, creativity instructions, and no creativity instructions) the participants received. Participants were not randomly assigned to the conditions. The participants had to fill out two different online surveys two weeks apart from each other. The core elements measured in every survey were personality traits, the creative self-efficacy and demographics. Furthermore, other variables as the creative growth mindset and the creative fixed mindset were measured as well (see Appendix C for the full questionnaire). Lastly, depending on the condition the participants were assigned to, the surveys differed partly and interventions took place in the timespan of two weeks, between those surveys (see Appendix D for differences between the surveys). All materials were provided in English and all surveys were filled out online.

The participants who received professional creativity training, filled out the first survey (pre-test) before the first session of the professional creativity training started (see Appendix C and Appendix D for the complete survey). They had two creativity trainings session à three hours in which they listened to lectures and participated in brainstorming exercises (about a topic of their choice) as a group and received homework to do individually between the sessions. After the second creativity training unit, they were asked to fill out the second (post-test) survey (see Appendix C and Appendix D for the complete survey). The participants from the professional creativity training condition are people who voluntarily signed up for a workshop about creativity and effective brainstorming. They were asked if they, additionally to the training, would volunteer to fill out the surveys anonymously for the purpose of this research project. The participants did not receive any compensation next to the professional creativity training they participated in.

The participants of the creativity instructions condition filled out the first survey (see Appendix C and Appendix D for the complete survey; pre-test) during which they got provided with brainstorming rules like "*The more, the better: Try to come up with as many ideas, solutions, or possibilities as you can think of. Write down all ideas that come to mind*" or "*Welcome new, wild or seemingly unfeasible ideas. Such original ideas are actually very helpful to come to creative ideas!*" (see Appendix E for the full instructions provided). Afterwards, they got instructed to brainstorm for at least four minutes. Two weeks followed; they received the second survey (post-test). This began with the same brainstorming instructions provided in the first survey (see Appendix C and Appendix D for the complete survey, see Appendix E for the full instructions provided). The participants of the creativity instructions condition got recruited via the prolific participant pool and received a compensation of £1.00 per survey and an additional £0.50 bonus, when filling out both surveys.

The participants of the condition without creativity instruction, did not receive any intervention over the two weeks nor during the survey (see Appendix C for the complete survey). They got recruited via the prolific participant pool and received a compensation of £0.50 per survey and an additional £0.25 bonus, when filling out both surveys. After finishing the post-test survey, participants of all conditions received a debriefing with an explanation of the study as well as contact information in case of any questions.

Measures

Creative Self-Efficacy

For the assessment of the participants' creative self-efficacy, a 6-item scale was used based on the short scale of creative self by Karwowski et al. (2013). It included items like *"I know I can efficiently solve even complicated problems"* and *"I trust my creative abilities"* (see Appendix C for the complete scale). All answers were given on a 5-point scale (1=

Definitely not, 5= *Definitely yes*). Cronbach's alpha was .88, taken the answers of the first and second wave into consideration. To measure the change of creative self-efficacy, the score from the first wave of a participant's creative self-efficacy will be subtracted from the creative self-efficacy score from the second wave. This is in the following parts called "creative self-efficacy".

Openness to Experience

To assess the participants' openness to experience, the two items from the BFI-10 were used (Rammstedt & John, 2007). The included items were *"I tend to see myself as someone who has few artistic interests"* (receded item) and *"I tend to see myself as someone who has an active imagination"* (see Appendix C for the complete scale). Cronbach's alpha would be .31 in wave 1 and .21 in wave 2 for openness to experience (Rammstedt & John, 2007). Given the low Cronbach's alpha, only one of the two items (*"I tend to see myself as someone who has an active imagination"*), but from wave 1 and wave 2, was taken into consideration for the analysis. This resulted in a new Cronbach's alpha of (.85). All answers were given on a 5-point scale (1= *Strongly disagree*, 5= *Strongly agree*).

Results

A final number of 126 participants were taken into consideration for the analysis. The overall exclusion rate was 47.19%. While the condition of the professional creativity training (*N*=14) had in exclusion rate of 36.36%, the creativity instructions condition (*N*=60) had significantly higher exclusion rate of 54.89% as well as the condition without any creativity instructions (*N*=62), which had an exclusion rate of 53.57%. Reasons for exclusion were failing of the seriousness screening, as well as indicating of not wanting their data to be used (see Appendix F for exclusion reasons and exclusion per condition).

Descriptives, correlations and Cronbach's alphas of variables are given in Table 1. The highest correlation was found between the total creative self-efficacy score (i.e., the total

score a participant scored on the SCSS scale) and openness to experience (.59, $p < 0.01$), suggesting that openness to experience character trait is indeed correlated to creative self-efficacy. Further, the creative growth mindset was positive related to both, the total creative self-efficacy (.52, $p < 0.01$) as well as openness to experience (0.45, $p < 0.01$). This suggests that if people indicate to have a creative growth mindset (i.e., that creativity is changeable rather than stationary) they also perceive themselves as more able to perform a creative task (i.e., creative self-efficacy) and are open to new experiences. Surprisingly, the gender and the total creative self-efficacy (i.e., sum of the total score of creative self-efficacy of both surveys) showed a small but still significant correlation (-.18, $p < 0.05$) indicating that gender might influence the perception of the own overall creative self-efficacy negatively. Additionally, the age of participants showed a significant negative correlation with the change of the creative self-efficacy (-.27, $p < 0.01$), suggesting that the older participants are, the fewer the change in creative self-efficacy.

Creativity Conditions

To test whether the amount of creativity training and guidance (i.e., professional creativity training, creativity instructions, or no instructions) the participants receive, are influential for a change in creative self-efficacy, a multiple linear regression got conducted. It is expected that professional creativity training will result in the highest increase of creative self-efficacy (Hypothesis 1), while the creativity instructions will result in a higher increase of creative self-efficacy in comparison to the condition without creativity training, but a lower increase in comparison to the condition with professional creativity training (Hypothesis 2). The categorical independent variable included three different levels (i.e., professional creativity training, creativity instructions, no creativity instructions). These were dummy coded, using the level of no creativity training as reference group. Consequently, the condition of professional creativity training and creativity instructions were tested against it.

The creativity condition with three different levels, is expected to influence the continuous dependent variable (change in creative self-efficacy). Before conducting the analysis, assumptions of linearity, multicollinearity, homoscedasticity, and independence of observations were checked. The data was in line with the assumptions. Further, no outlier was found.

The results of the multiple regression show a significant positive relationship of the professional creativity training condition (b=.33, t (123) = 3.66, p<.001) with the change in creative self-efficacy. This supports the Hypothesis 1, as it indicates that the professional creativity trainings condition is significantly correlated with an increase in creative self-efficacy. Contrary to the expectations, no significant relationship between the creativity instructions and the change in creative self-efficacy was found in comparison to no creativity training (b=-.16, t (123) = - 1.76, p=.08) but in comparison to professional creativity training (b=.23, t (123) = 2.58, p=.011). It follows that creativity instructions are not significantly different in influencing creative self-efficacy from no creativity instructions. The significant difference found from professional creativity training in influencing creative self-efficacy is in line with the previous findings indicating that professional creativity training significantly positively influences the change in creative self-efficacy, while creativity instructions do not. Consequently, Hypothesis 2 was not supported.

Openness to Experience

Next to the main effect described above, I wanted to investigate whether openness to experience moderates the relationship between the amount of creativity training and guidance the participants received and the positive change in creative self-efficacy. Two competing hypotheses are tested to show if openness to experience strengthens (Hypothesis 3.1) or weakens this relationship (Hypothesis 3.2).

To investigate this, the same multiple linear regression as discussed above, was conducted, with the addition of including openness to experience as a moderator in the analysis. The multiple linear regression conducted showed no significant effects for the interaction of openness to experience with the professional creativity training (p=.95) nor for the interaction of openness to experiences with the creativity instruction condition (p=.32). Consequently, the Hypothesis 3.1 and Hypothesis 3.2 both are not supported.

Exploratory Analysis

Next to openness to experience, extraversion showed relatively stable patterns of typical thinking, feeling, and acting linked to creativity which allow a variety of impulses for creative thinking and creativity in general (Kandler et al., 2016). Additionally, extraversion showed in several studies to have a positive relationship with creativity (Furnham et al., 2009; Furnham & Bachtiar, 2008; King et al., 1996). Consequently, the same analysis was conducted with extraversion as moderator, instead of openness to experience, to explore this possible relationship further. Also here, the multiple regression showed no significant interaction effect for the interaction of professional creativity training and extraversion (p=.86). Likewise, no significant result for the interaction effect of creativity instructions with extraversion were shown (p=.37).

Further, a strong positive correlation between the total score of creative self-efficacy and the creative growth mindset was found in the preliminary analysis. For this reason, the same multiple linear regression with the total score of the creative growth mindset (i.e., the total score a participant scored on the creative growth mindset scale) as a moderator was conducted. No significant interaction effect between the professional creativity training and the creative growth mindset (p=.19) was found, as well as for the interaction effect between creativity instructions and the creative growth mindset (p=.17).

Lastly, the same multiple linear regression with age as a moderator was conducted, given the strong correlation between creative-self-efficacy and age, stated in the preliminary analysis. Again, no significant interaction effect was shown between the creativity instruction condition and age ($p=.74$). However, a significant interaction effect of the professional creativity training and age was found ($b=-.258$, t (123) = -2.49, $p=.014$), indicating that the older a participant in the professional creativity training condition is, the less change in creative self-efficacy is to be expected.

Discussion

The conducted study investigated whether the amount of creativity training and guidance (i.e., professional creativity training, creativity instructions, or no creativity instructions) the participants received, are influential for a change in creative self-efficacy and if this relationship is moderated by the participant's openness to experience. While some studies did not find a significant effect of creativity training on creative self-efficacy (Starkey et al., 2017; Meinel et al., 2019). We expected and found that participants in the professional creativity training (including lectures, discussions and homework) condition, will show the highest increase of creative self-efficacy, in comparison to participants receiving no creativity instructions at all. This is based on already conducted studies, indicating that creativity training may be able to increase the participants' creative self-efficacy (Mathisen & Bronnick, 2009; Tang & Werner, 2017), especially when lectures are combined with the practicing of brainstorming as well as cognitive modeling (Gist, 1989). Additionally, this new developed knowledge should be paired with an assurance, that the participants can use these learned rules and strategies successfully (Bandura, 1997; Schunk & Rice, 1987). Overall, this provides further support that this approach and professional creativity training is indeed useful to enhance people's creative self-efficacy and therefore not only their creative performance in general (Farmer & Tierney, 2017; Liu et al., 2016; Ng & Feldman, 2012), but also the

participants' overall well-being, adaptation to the demands of daily life of people (Cropley, 1990; Reiter-Palmon et al., 1998) and perspective of seeing difficult tasks rather as challenges to face than obstacles to avoid (Bandura, 1997).

Contrary to our expectations, the data did not support the claim that participants receiving brainstorming instructions (e.g., the brainstorming rules and instructions for a short brainstorming session) will show a lower increase of self-efficacy than participants who received a professional creativity training, but higher increase of self-efficacy than participants who did not receive any creativity instructions, after a timespan of two weeks. Hence, participants who received creativity instructions did not show a significantly higher increase of creative self-efficacy in comparison to participants receiving no creativity training at all. Our expectations were based on the theoretical background that, receiving creativity instructions (i.e., how to be creative) as well as instructions to brainstorm enhance creativity, creative outcomes thus potentially creative self-efficacy (Chen et al., 2002; Chen et al., 2005; Niu & Liu, 2009, Parnes & Meadow, 1959). Additionally, a meta-analysis of 70 studies regarding creativity trainings programs suggested that successful creativity training entails the focus on the development of cognitive skills (Scott & Mumford, 2004) and the practicing of brainstorming (Gist, 1989) which both was present when giving the creativity instructions. Nonetheless, the results found were not in line with the theory provided. One possible reason for this is, that while creativity instructions were given and the participants were asked to engage in brainstorming activities, no direct evaluation or encouragement took place while engaging in these exercises. Since encouragement shows to have a positive influence on creativity (Puente-Díaz & Cavazos-Arroyo, 2017), this could be a valid explanation. Further, the combination of solitary and group brainstorming is suggested to be the most efficient (Osborn, 1963). Given that the participants of the professional creativity training had direct feedback from the other participants (i.e., when discussing ideas) as well as collaborative

brainstorming exercises, this gives another potential explanation about why the professional creativity training showed to be more effective in enhancing the participants creative self-efficacy. Lastly, during the professional creativity training, the participants had positive experiences related to the other participants (i.e., successfully coming up with new solutions together) as well as with the instructor (i.e., being a guide if participants feel stuck or motivating for new exercises). This might be an important factor distinguishing the effectiveness from the both different settings, considering the importance of people's previous experiences in expressing their ideas and the supportive feedback they received in relation to their creative self-efficacy (Beghetto, 2013; Paulus & Nijstad, 2003). Nonetheless, even though the initial claim was not supported by the data, the results pointed into important and interesting directions for future research.

Furthermore, it was investigated whether higher openness to experience will lead to a higher increase in creative self-efficacy as opposed to lower openness to experience, or if lower openness to experience will lead to a higher increase in creative self-efficacy as opposed to higher openness to experience. We recognized the possibility that both outcomes might be possible since, on the one hand, many studies have found correlations between specific personality traits and creativity (Batey & Furnham, 2006; Feist 1998), especially openness to experience, with has been conceptualized as the core trait underlying creativity (McCare, 1987). Nonetheless, people who have a high openness to experience could have a higher baseline creative self-efficacy. Consequently, their trainings effect and increase in creative self-efficacy would be lower than of participants starting with a low initial openness to experience (Meinel et al., 2019).

The data did not clearly support any of these options in regards of a possible positive or negative moderation effect of openness to experience, since no significant correlation was found. One possible explanation for this could be that the scale chosen, after excluding one

item, was not sufficient enough to really examine a person's openness to experience. Even though a Cronbach's Alpha of .85 was found, it has to be considered after the original scale (with one receded item) showed a Cronbach's Alpha of only .31 in wave 1 and .21 in wave 2 and was rejected for this reason. Consequently, a different, maybe more elaborate scale should be used for research in similar matters. Further, while the theory connects different personality traits with creativity (Batey & Furnham, 2006; Feist 1998), this does not necessarily mean it connects them to creative self-efficacy. Till now, no explicit and common definition of what creativity consists of is given (Kandler et al., 2016). Therefore, even though creative self-efficacy is strongly connected to creativity and creative performance, personality traits might influence different aspects of creativity. Correspondingly, this would also be an explanation while during the exploratory analysis, no connection between creative self-efficacy and extraversion was found as well. Despite that extraversion has shown a positive relationship to creativity in a variety of studies (Furnham & Bachtiar, 2008; Furnham et al., 2009; King et. al, 1996), similar to openness to experience.

Lastly, the exploratory analysis showed a negative significant interaction effect with age between the professional creativity training the participants received and the creative self-efficacy. Suggesting that the older the participants were, the more negative the relationship between the professional creativity training and the creative self-efficacy was influenced. Consequently, it could be assumed that the younger people are who participate in a professional creativity training, the more beneficial for the increase of their creative self-efficacy it will be.

Limitations

While the findings of the studies might already be useful and giving insights about the relationship between different levels of creativity training and creative self-efficacy, it is

important to mention some limitations. One limitation of the study provided is the high drop-out/ exclusion rate. Seeing that less than 50% of participants finished the study in the creativity instructions condition and condition without any creativity instruction provided gives a distorted picture. This non-random dropout increases the risk of an attrition bias, which means that there could be a significant difference between the participants who finished the study and those who did not. Future research could focus on whether a difference between participants who did and did not finish the creativity intervention exists. Which might lead to an understanding of why the findings differed from what was expected based on the provided theory.

Further, given that only 14 participants were in the professional creativity training condition, hence the sample sizes of the different conditions were imbalanced, the power of the provided data is lower than if equal sample sizes would have been provided. Consequently, single scores of the professional creativity training condition have a way greater impact on the overall score than in the creativity instruction condition with a total of 60 participants or on the condition without any creativity training with a total of 52 participants.

Moreover, the participants were not completely randomly assigned to the conditions. While the participants of the professional creativity training joined voluntarily, without any incentives given except the training itself, was this a different case for the creativity instructions condition and the condition without any creativity training. In latter, participants were paid to participate. This results in two very different motives. While the participants in the professional creativity training showed intrinsic motivation or even interest in the topic of creativity, participants of the other two conditions were rather extrinsically motivated, through the monetary incentive.

Lastly, the demographics of the creativity instructions condition and the condition without any creativity instructions were the same, as they all were current residents of the United Kingdom or the United States. Contrary, the participants of the professional creativity training condition were current residents of the Netherlands, having a variety of different countries of origin. This might influence the efficiency of creative self-efficacy more than it is known yet as, as previous literature indicates that the country of origin might influence a person's reaction to creativity instructions (Niu & Liu, 2009).

Avenues for Future Research

The results add to the understanding what level of creativity training (i.e., professional creativity training, creativity instructions) needs to be provided to have a positive impact on a person's creative self-efficacy. Other levels of creativity training or closer differentiations e.g., between different methods of professional creativity training, could investigated in the future. Doing so would have great avenues for future research, as it sheds light onto how much which part of professional creativity training (e.g., lectures, brainstorming exercises, cognitive modeling etc.) contributes to an enhancement of the creative self-efficacy or whether a combination of those different techniques has to be present. This would also contribute to the discussion whether creative self-efficacy is best achieved by the development of knowledge, rules, and strategies in combination with getting assured about one's capability to use these strategies (Locke et al., 1984; Schunk & Rice, 1987), by the combination of lectures, practicing brainstorming and cognitive modeling (Gist, 1989) during the creativity training or because of the processes linked to the idea generation, problem finding or conceptual combining (Scott et al., 2004).

Further, investigating the influence a person's openness to experience has on the effectiveness of creativity training provides first insights about how individual differences

might facilitate or impede trainings results. Other individual differences as suggested in the exploratory analysis (e.g., demographics, personality traits, mindsets) could be key-components of future research enabling us to understand what kind of creativity training is most effective from whom and, in the long-run, why. This gives great opportunities for the future to provide everyone with the best possible creativity training, depending on their individual differences, warranting a greater amount of people to benefit from such and improve in the most efficient way.

Theoretical and Practical Implications

As far as the theoretical implications concern, the study provides further insights about the relationship between creativity training and creative self-efficacy and to which extend training and guidance is needed to experience an increase in creative self-efficacy. Even though the number of studies on creative self-efficacy increased in the last couple years, it is still insufficient (Unal & Tasar, 2021). Further, over 95% of the studies concerning creative self-efficacy are singly country-studies or conducted in the United States of America or Asia (Unal & Tasar, 2021), while the provided study was conducted with residents from different countries (e.g., the United Kingdom and the Netherlands). Additionally, the majority of creative-self efficacy studies were conducted in the United States of America or Asia (Unal & Tasar, 2021). Regions which are known for great innovations, opportunities and competition amongst each other, which might have an influence on the creative self-efficacy of participants or their mindset in regards of that.

Further, the researched moderation effect, which was found to be not significant, of openness to experience adds a different perspective of the theory pointing into the direction of personality traits being influential for creativity. This sheds more light onto different dimensions creativity might entails and that these do not have to be connected to each other.

Lastly, the found interaction effect of age with the professional creativity training suggests that following a professional creativity training is the most beneficial when participants are younger. This is in line with other research, suggesting that because of already existing knowledge structures, older people are more inclined to have restrictive heuristics and thought patterns, leading individuals to think the same way (Agogué et al., 2014). For this reason, the starting point for creativity training for younger in comparison to older people might be a different one. This has practical implications not only for the educational system, making it more attractive to add creativity training early on for students to benefit the most. But also, for the conception and execution of creativity training for older people with targeting first the restrictive heuristics and thought patterns which might be enabling to fulfill their full creative potential.

Conclusion

The key motivation of this research was to understand how the level of creativity training a person receives influences their creative self-efficacy and to what extent a person's openness to experience influences this relationship. Creative self-efficacy was shown as one of the key determents in if a person will engage in a creative task or not, as well as for a person's well-being. This stresses the importance of efficient creativity training to benefit participants in a variety of life situations, regardless if for creative masterpieces (Big C creativity) or day-to-day creative activities (Little c creativity).

In line with our expectations, the data supported the theory that professional creativity training enhanced the creative self-efficacy of participants, in comparison to participants receiving creativity instructions or no creativity training at all. Supporting the participation in such, when wanting to improve one's creative self-efficacy. Further, it appeared that the younger the participants are, the more efficient the trainings effect on the creative self-

efficacy is. Hence, these results give reasons to think about implementing professional creativity training already early on to enhance the creative self-efficacy and therefore the creative performance. In the same way, future research could investigate whether professional creativity training might be more effective for older participants, when targeting possible restrictive heuristics and thought patterns during the training.

Furthermore, the results did not show a significant difference between receiving creativity instructions or receiving no creativity training at all, pointing into the direction of the importance of a well-designed creativity training, when wanting to increase the creative self-efficacy. Additionally, follow-up research could shed light onto why receiving creativity instructions were not significantly better for the enhancement for the creative self-efficacy, despite a variety of theories suggesting differently.

Finally, while the no significant interaction effect between openness to experience and the relationship between the amount of creativity training and guidance received and the creative self-efficacy was found, other individual differences like demographics or mindsets might be an important factor in the effectiveness of creativity and should be investigated further in the future.

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Table 1

Descriptives, Correlations and Cronbach's Alpha if Applicable in Brackets

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1. Gender	1.81	.47	-								
2. Age	29.18	4.07	.02	-							
3. Highest Degree	2.42	.66	-.10	.12	-						
4. Condition	1.06	.94	.05	-.11	.14	-					
5. Total Creative Self-Efficacy	44.36	7.26	-.18*	.02	-.12	-.02	(.88)				
6. Openness	7.76	1.75	-.04	.07	-.07	-.02	.59**	(.85)			
7. Creativity Growth Mindset	29.18	6.13	-.08	-.09	-.08	.01	.52**	.45**	(.93)		
8. Creative Fixed Mindset	28.20	7.86	.07	.13	.15	.07	-.34**	-.29**	-.64**	(.91)	
9. Change Creative Self-Efficacy	.47	1.95	-.07	-.27**	-.14	.14	.04	-.03	.04	-.165	-

Note. n= 126. *p < 0.05; **p < 0.01; Gender coded 1=male, 2=female, 3=others; Highest Degree coded 1= High School, 2= Bachelor's Degree,

3=Master's Degree, 4=PhD; Condition coded 0=no instructions, 1=creativity training, 2=creativity instructions

Appendix A

Percental Distribution of Participants by Country of Origin and Creativity Trainings Condition

Professional Creativity Training

Country of Origin	Distribution in %
Germany	21
Spain	21
Netherlands	14
Italy	14
Chile	7
Norwegian	7
Saudi Arabia	7
Ukraine	7

Creativity Instructions

Country of Origin	Distribution in %
United Kingdom	87
Poland	3
Australia	2
Canada	2
China	2
Egypt	2
Greece	2

No Creativity Instructions

Country of Origin	Distribution in %
United Kingdom	79
Greece	4
America	2
China	2
Finland	2
Ireland	2
Italy	2
Lithuania	2
Nigeria	2
Poland	2
UK / America	2

Appendix B

Distribution of Highest Level of Education by Level of Creativity Training

Highest Level of Education	Professional Creativity Training	Creativity Instructions	No Creativity Instructions
High School	-	-	1
Bachelor's Degree	11	37	34
Master's Degree	3	14	15
Ph.D.	-	9	2

Appendix C

Core Survey

Pre-Test Survey:

Block 1

I believe I have the ability to change my basic creativity level considerably over time (1)
Regardless of my current creativity level, I think I have the capacity to change it quite a bit (2)
I believe I can always substantially improve my creativity (3)
With enough time and effort, I think I could significantly improve my creativity level (4)
You either are creative or you are not—even trying very hard you cannot change much (5)
You have to be born a creator—without innate talent you can only be a scribbler (6)
Creativity can be developed, but one either is or is not a truly creative person (7)
Some people are creative, others aren't—and no practice can change it (8)
A truly creative talent is innate and constant throughout one's entire (9)
   ⇨ **Creative Growth Mindset Scale** Li, Zhang, Zhang, Zhang, Nunez & Shi (2020). (item 1-4)
   ⇨ **Creative fixed mindset schale** (Karwowski, 2014) (item 5-9)

I know I can efficiently solve even complicated problems (1)
I trust my creative abilities (2)
Compared to my friends, I am distinguished by my imagination and ingenuity (3)
Many times I have proved that I can cope with difficult situations (4)
I am sure I can deal with problems requiring creative thinking (5)
I am good at proposing original solutions to problems (6)
   ⇨ **Creative self-efficacy: Short Scale of Creative Self (SSCS; Karwowski et al., 2013)**

I tend to see myself as someone who…
…is reserved (1)
…is generally trusting (2)
…tends to be lazy (3)
…is relaxed, handles stress well (4)
…has few artistic interests (5)
…is outgoing, sociable (6)
…tends to find fault with others (7)
…does a thorough job (8)
…gets nervous easily (9)
…has an active imagination (10)
   ⇨ **Big 5: BFI-10** (Rammstedt & John, 2007)

Block 2

What is your gender?
What is your age?
What is your native language?

What is your nationality?
What is your field of occupation?
What is your highest level of education?

I paid attention while filling out this survey:

Post-Test Survey:

Block 1

I believe I have the ability to change my basic creativity level considerably over time (1)
Regardless of my current creativity level, I think I have the capacity to change it quite a bit (2)
I believe I can always substantially improve my creativity (3)
With enough time and effort, I think I could significantly improve my creativity level (4)
You either are creative or you are not—even trying very hard you cannot change much (5)
You have to be born a creator—without innate talent you can only be a scribbler (6)
Creativity can be developed, but one either is or is not a truly creative person (7)
Some people are creative, others aren't—and no practice can change it (8)
A truly creative talent is innate and constant throughout one's entire (9)
  ⇨ **Creative Growth Mindset Scale** Li, Zhang, Zhang, Zhang, Nunez & Shi (2020). (item 1-4)
  ⇨ **Creative fixed mindset schale** (Karwowski, 2014) (item 5-9)

I know I can efficiently solve even complicated problems (1)
I trust my creative abilities (2)
Compared to my friends, I am distinguished by my imagination and ingenuity (3)
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I am sure I can deal with problems requiring creative thinking (5)
I am good at proposing original solutions to problems (6)
  ⇨ **Creative self-efficacy: Short Scale of Creative Self (SSCS; Karwowski et al., 2013)**

I tend to see myself as someone who…
…is reserved (1)
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…is relaxed, handles stress well (4)
…has few artistic interests (5)
…is outgoing, sociable (6)
…tends to find fault with others (7)
…does a thorough job (8)
…gets nervous easily (9)
…has an active imagination (10)
  ⇨ **Big 5: BFI-10** (Rammstedt & John, 2007)

Block 2

What is your gender?
What is your age?
What is your native language?
What is your nationality?
What is your field of occupation?
What is your highest level of education?

I paid attention while filling out this survey:

Block 3

Thank you very much for your participation in this study. Please remember that your individual responses are anonymous and confidential.

Explanation of the Study: Thank you for your participation in our study. In this project we aim to investigate if and how creativity training (vs. creativity instruction or no creativity intervention) contributes to one's creative self-efficacy, that is, the belief one has in their own ability and potential to generate novel and useful ideas. We expect that creativity training will contribute to this, more so than creativity instructions alone or no instructions at all. Additionally, we investigate for whom creativity training will be especially helpful in this regard. Based on the literature so far, this is not clear yet: it could be that creativity training is especially effective for people who score high on openness to experience; but it could also be that creativity training is especially effective for people scoring low on openness to experience. With this study, we hope to get a better understanding of this. This is, to the best of our knowledge, the first study that investigates this. If you would like to know more about this research and our findings, you can contact us.

Contact Information:
The study is being conducted by Dr. Kiki de Jonge at Groningen University (k.m.m.de.jonge@rug.nl). If you have further questions, comments or are interested in the results of the study, you are welcome to contact us by email.

Appendix D

Differences Between the Core Survey by Condition Assigned to

For core survey see Appendix C

Professional Creativity Training

Pre-Test

To keep increasing our knowledge about effective brainstorming and creativity, it would be great to be able to use your answers *anonymously* for research. This will allow us to further understand how brainstorming and creativity can be optimized, both during future workshops and for our general knowledge on this topic.My answers in this survey can be used *anonymously* for research purposes:

⇨ **Before Block 2**

Post-Test

What is the main thing you learned during our workshop on Effective Brainstorming: towards Creativity and Innovation?
Which of your qualities would you like to use to stimulate your creativity?
(You can paste the qualities here that you wrote down during session 1)
How will using these qualities help you to stimulate your creativity?

⇨ **Before Block 1**

To keep increasing our knowledge about effective brainstorming and creativity, it would be great to be able to use your answers *anonymously* for research. This will allow us to further understand how brainstorming and creativity can be optimized, both during future workshops and for our general knowledge on this topic. My answers in this survey can be used *anonymously* for research purposes:

⇨ **Before Block 2**

Creativity Instructions

Pre-Test

Please think of a topic that is relevant for you to brainstorm about, this can be any topic that is interesting for you to generate new ideas on. Please think of many possible ideas on your topic and write your ideas down. For this, keep the following guidelines in mind:

• The more, the better: Try to come up with as many ideas, solutions, or possibilities as you can think of. Write down all ideas that come to mind.

• Welcome new, wild or seemingly unfeasible ideas. Such original ideas are actually very helpful to come to creative ideas!

• Do not criticize your own ideas. No idea is too strange or weird at this point, let all your ideas flow to come to new ideas.

• Try to combine your ideas and build on them to come to new ones.

You have up to 6 minutes for this. After 4 minutes, the next button will appear and you can continue to the next page if you want to. After 6 minutes, you are automatically referred to the next page.

If you want to save your ideas for yourself as well, make a screenshot before moving to the next page.

Write down your brainstorm topic and ideas here:

⇨ **Before Block 2**

Post-Test

Please think of a topic that is relevant for you to brainstorm about, this can be any topic that is interesting for you to generate new ideas on. Please think of many possible ideas on your topic and write your ideas down. For this, keep the following guidelines in mind:

• The more, the better: Try to come up with as many ideas, solutions, or possibilities as you can think of. Write down all ideas that come to mind.

• Welcome new, wild or seemingly unfeasible ideas. Such original ideas are actually very helpful to come to creative ideas!

• Do not criticize your own ideas. No idea is too strange or weird at this point, let all your ideas flow to come to new ideas.

• Try to combine your ideas and build on them to come to new ones.

You have up to 6 minutes for this. After 4 minutes, the next button will appear and you can continue to the next page if you want to. After 6 minutes, you are automatically referred to the next page.

If you want to save your ideas for yourself as well, make a screenshot before moving to the next page.

Write down your brainstorm topic and ideas here:

⇨ **Before Block 1**

Appendix E

Brainstorming Rules

1. The more, the better: Try to come up with as many ideas, solutions, or possibilities as you can think of. Write down all ideas that come to mind.
2. Welcome new, wild or seemingly unfeasible ideas. Such original ideas are actually very helpful to come to creative ideas!
3. Do not criticize your own ideas. No idea is too strange or weird at this point, let all your ideas flow to come to new ideas.
4. Try to combine your ideas and build on them to come to new ones.

Appendix F

Exclusion Criteria

Wave 1

Exclusion Criteria	Professional Creativity Training	Creativity Instructions	No Creativity Instructions
Finishing the survey in less than two minutes* or seven minutes**	-	28	27
Brainstorming answers indicating the task was not taken seriously	-	8	-
Same score for the normal and reversed item more than three times for the BFI-10	-	1	-
Same score for each item of a scale	-	9	3
Extreme long survey duration	-	3	1
Indication that they do not want their data do be used	1	-	-
Indicating that they did not pay attention while filling out the survey	-	-	-
Total Exclusions	1	34	28

* No Creativity Instructions

** Creativity Instructions

Note. Participants could be excluded because a combination of the above-mentioned reasons. Therefore, see row "Total Exclusions" to see how many participants got excluded in total per condition.

Wave 2

Exclusion Criteria	Professional Creativity Training	Creativity Instructions	No Creativity Instructions

Finishing the survey in less than one and a half minutes* or six minutes**	-	11	8
Brainstorming answers indicating the task was not taken seriously	-	1	-
Same score for the normal and reversed item more than three times for the BFI-10	-	2	-
Same score for each item of a scale	-	3	-
Extreme long survey duration	-	1	2
Indication that they do not want their data do be used	-	-	-
Indicating that they did not pay attention while filling out the survey	-	-	-
Only one survey completed	4	32	30
Total Exclusions	4	39	32

* No Creativity Instructions

** Creativity Instructions

Note. Participants could be excluded because a combination of the above-mentioned reasons. Therefore, see row "Total Exclusions" to see how many participants got excluded in total per condition.