



The inspirational power of arts on creativity

Donghwy An^a, Nara Youn^{b,*}

^a Department of Culture and Art Management, Hongik University, 94 Wausan-ro, Mapo-gu, 121-791, Seoul 04066, South Korea

^b Marketing Department, Hongik University, 94 Wausan-ro, Mapo-gu, 121-791, Seoul 04066, South Korea



ARTICLE INFO

Keywords:

Arts
Creativity
Inspiration
Aesthetic experience

ABSTRACT

We propose that openness to aesthetics and the experience of art enhances individuals' creativity by imbuing them with a sense of inspiration. Although previous literature has claimed that aesthetic experiences increase creativity, there is a shortage of empirical evidence documenting the psychological process that underlies this effect or testing whether it can transfer to domains outside of the arts. To shed light on the process mechanism and test the domain-generalizability of the effect, we investigated the relationships among appreciation of art, inspiration, and creativity in four studies. Participants with open attitudes toward aesthetic experiences were more likely to be inspired and therefore better able to generate creative solutions (Study 1). Appreciating works of art brought about inspiration, which in turn enhanced creativity (Study 2). Finally, the power of art appreciation extended to a business environment, where it enhanced performance in product design, brand-naming, and problem solution generation (Studies 3a and 3b).

1. Introduction

In recent years, an increasing amount of attention has been paid to the ways in which art might benefit business organization, marketing, and strategy, and research has revealed several beneficial effects of art interventions for companies. For instance, exposure to art positively influences profitability and marketing persuasiveness, external and internal company relationships, the development of leadership and organizational culture, self-discovery and personal growth, collaboration, activation of emotions and energy, and creativity through openness to new experiences and widened perspectives (Artlab, 2009; Berthoin Antal & Strauß, 2013; Eriksson, 2009; Katz-Buonincontro, 2008; van den Broeck, Cools, & Maenhout, 2008). Among these effects, the last has generated some of the most interest, as creativity is essential for generating unusual and novel ideas, which can drive organizational success—especially in a rapidly changing and competitive economic climate.

Creativity is the generation of ideas or problem solutions that are both novel and appropriate (Amabile, 1983; Guilford, 1967). Consumer creativity is a similar problem-solving capability specifically applied to consumption-related problems (Hirschman, 1980). Firms including Home Depot, Ikea, and Michaels rely heavily on consumer creativity, using consumers as a source of creative new product ideas and even as co-producers of products. In this role as “prosumers,” consumers actively engage in new product development, offering fresh and creative ideas to companies through contests or crowdsourcing platforms and

innovative alternative uses of products. Companies such as Dell, Electrolux, Threadless, LEGO, General Mills, BMW, and Starbucks, just to name a few, have developed open innovation platforms that allow consumers to post ideas to the company online and through social media. Creativity among employees who think outside the box can also be strategically exploited by companies to generate innovative new product ideas (Bare & Oldham, 2006; Burroughs, Dahl, Moreau, Chattopadhyay, & Gorn, 2011; George & Zhou, 2001; James, Brodersen, & Jacob, 2004). To this end, a substantial number of companies have implemented creativity training programs for employees working in areas such as new product design (Burroughs et al., 2011).

As companies' recognition of the benefits of creativity has increased, many art programs have been employed in workplaces as a fresh approach to bring about innovation (Berthoin Antal & Strauß, 2013). The literature on such approaches, however, is nascent and almost entirely anecdotal, and only a few studies have tried to theoretically investigate the effects of art appreciation on creativity and unveil the underlying psychological processes. The key objective of our research was therefore to empirically document that experiencing art leads to greater creativity because art inspires people.

We took an experimental approach to theoretically test the effects of art and, further, to test whether inspiration and creativity induced through the experience of art can transfer to business-related contexts. Although it is generally accepted that involvement in artistic activities fosters creativity in the field of art education (Dewey, 1989; Guetzkow, 2002), there remains skepticism about the notion that psychological

* Corresponding author.

E-mail address: nara@hongik.ac.kr (N. Youn).

aspects underlying successful creative performance can transfer from domain to domain (Baer, 1998).

In the next section, we review literature establishing the relationship between art and creativity. Next, we introduce the concept of inspiration as a psychological construct to explain how art stimulates creativity. Last, we present the results of four studies in support of our hypotheses.

2. Creativity and art

Previous research empirically investigating the effects of the arts in business settings has shown that art interventions elicit positive reactions from those involved, including both managers and employees (Berthoin Antal & Strauß, 2013). For example, Eriksson (2009) investigated Arts in Residence in Science (AIRIS) projects and reported that through these projects, employees increased their creativity by “getting a new outlook on [work] and breaking conventional patterns” (p. 2), which increased their innovation and competitiveness and, in consequence, that of their whole organizations (Eriksson, 2009; Styhre & Eriksson, 2008). These findings thus support the argument that art can serve as a tool for generating creativity and innovation within firms (Berthoin Antal & Strauß, 2013; Eriksson, 2009; Styhre & Eriksson, 2008).

Research in art education has also demonstrated art's potential for enhancing creativity. Burton, Horowitz, and Abeles (1999) studied students with high exposure to drama, dance, music, and art and found that they outperformed those with less exposure to arts-related activities on creativity tasks (TTCT: the Torrance Tests of Creative Thinking, which measure fluency, originality, elaboration, and resistance to closure) and the Teacher Perception Scale, which measures idea expression, risk-taking, and imagination. Arts-based improvisational activities such as dancing and acting also increased divergent thinking among elementary students: Sowden, Clements, Redlich, and Lewis (2015) showed that students who participated in an improvisational dance class outperformed those who participated in a non-improvised dance class in a subsequent toy-design task.

Research has examined the creativity-enhancing potential of not only engagement with art but aesthetic experiences as they relate to individual dispositions such as openness to aesthetics. Costa and McCrae (1992) defined openness to aesthetics as “a deep appreciation for art and beauty” and included it as a facet of openness to experience, one of the Big Five traits of personality differences (McCrae & Costa, 1997). Individuals with high openness to experience actively seek and appreciate experiences for their own sake, are imaginative and sensitive to art and beauty, and have rich and complex emotional lives (Costa & McCrae, 1992). Many studies have found that the more open an individual is to new experiences, the more he or she will engage in artistic activities, and more open individuals show a greater capacity for imaginative and divergent thinking, which is a more flexible and fluent processing style facilitating idea generation (Chamorro-Premuzic et al., 2009; Feist & Brady, 2004; Furnham & Avison, 1997; McCrae, 1987; McCrae & Costa, 1997; Rawlings, Barrantes, Vidal, & Furnham, 2000). Greater openness to aesthetics has been shown to be highly predictive of self-reported creative pursuits and interests (Griffin & McDermott, 1998). These findings provide theoretical support for the main hypothesis that we empirically tested in the studies reported here—that there is a positive relationship between experiencing works of art and being creative.

3. Inspiration and creativity

The view that inspiration is closely linked to the development of creative ideas has existed since ancient times. In Greek mythology, Muses were the goddesses of inspiration, who whispered ideas of brilliance to creators and guided their creative processes in literature, science, and the arts. Now, the term “muse” is used to depict a source of

creativity for any field that requires creative insight (Miller & C'Debaca, 1994; Thrash & Elliot, 2004). Empirical psychologists have recently turned their attention to inspiration and examined whether muses can be elevated from their mythical origins to a scientific level (Milyavskaya, Ianakieva, Foxen-Craft, Colantuoni, & Koestner, 2012).

The *Oxford Dictionary of English* defines “inspiration” as “the process of being mentally stimulated to do or feel something, especially to do something creative.” Thrash and colleagues conceptualized inspiration as comprising three components: evocation, transcendence, and motivation (Thrash & Elliot, 2003). Inspiration is, first, unintentionally evoked by external or internal stimuli. Afterward, a sense of transcendence occurs, making the individual aware of more than his or her usual concerns. Finally, this awareness encourages the individual to actualize the evoked idea, transforming into motivation. Based on this tripartite conceptualization, Thrash and Elliot (2003) constructed the Inspiration Scale as a measure of inspiration and showed that it predicted “creative self-conception” in subjects.

In a departure from this conceptualization, Oleynick, Thrash, LeFevre, Moldovan, and Kieffaber (2014) emphasized that inspiration explains “the motivational transmission” to creative ideas rather than a source of creativity. Unlike previous theories on the relationship between inspiration and creativity, Oleynick et al.'s conception hinges on the idea that inspiration may mediate the generation of creative ideas. Taking this point of view, it can reasonably be suggested that appreciating works of art can enhance creativity because such appreciation triggers inspiration. Indeed, composers of poetry, science writing, and fiction who felt inspired while writing were more motivated and actualized more creative ideas than those who did not (Thrash, Maruskin, Cassidy, Fryer, & Ryan, 2010).

Our review of the literature suggests that individuals with more open attitudes toward artistic activities tend to engage in more divergent thinking (Chamorro-Premuzic et al., 2009; Feist & Brady, 2004; Furnham & Avison, 1997; McCrae, 1987; McCrae & Costa, 1997; Rawlings et al., 2000), to display more creative behaviors and interests (Griffin & McDermott, 1998), and to experience more inspiration (Thrash & Elliot, 2003). We therefore expected aesthetic experiences, inspiration, and creativity to positively correlate, predicting the following:

H1. *Individuals with more openness toward aesthetic experience should be inspired more often and more deeply in their daily lives and show greater creativity than those with less open attitudes toward aesthetics.*

Building on this idea, we also predicted that when participants recalled a time they had experienced works of art—an induction of aesthetic experience—their state inspiration (measured using items associated with evocation, transcendence, and motivation; Thrash et al., 2010) would be increased and would in turn enhance their creative performance. Thus, we proposed the following:

H2. *Individuals who recall experiencing works of art should show greater inspiration and, thus, more creativity than those who recall aspects of their typical daily lives.*

Next, we extended the effect of art appreciation on creative performance to the business domain (Table 1). More specifically, we examined participants' problem-solving capability in a business-relevant context. Previous research on creativity has provided mixed suggestions about whether creativity transfers from domain to domain (Baer, 2010). Some researchers have argued that creativity derives from a general set of psychological descriptors—skills, aptitudes, traits, propensities, motivations, and behaviors—that can be productively deployed in any domain (Plucker, 1998). Others have claimed that the psychological descriptors underlying creative performance vary across domains (Baer, 1998). For instance, art appreciation might lead to higher creativity in the arts but not transfer to the realm of business.

Thus, we investigated whether people exposed to painting or poetry would design a computer keyboard, name a brand, and provide

Table 1
Representative research for the effect of art appreciation on creativity.

Study	Input variable(s)	Targets	Outcome variable(s)	Research methodology
Berthoin Antal and Strauß (2013)	Art intervention programs	Organizations	Creativity and innovation	Survey
Boyle and Ottensmeyer (2005)	Arts-based learning program	Managers	Creativity and risk-taking in generating radical product ideas; open-mindedness and confidence in expressing ideas and experimenting with new ways of thinking	Interview
Brinkmann and Sritraman (2009)	Aesthetic emotion	Mathematicians	Creative work in mathematics	Interview
Burton et al. (1999)	Visual arts, music, dance, and drama programs in schools	Elementary and middle school students	Enhanced Torrance tests of creative thinking	Survey
Cote (2008)	Arts-infused curriculum	Elementary school students and teachers	Creativity	Interview
Eriksson (2009)	Art intervention programs	Employees	Workplace creativity and innovation	Interview
Karakelle (2009)	Drama course	Postgraduate students	Divergent thinking (alternative uses of objects)	Experiments
Kerr and Lloyd (2008)	Art-based learning program	MBA students	Perspective-taking; imaginativeness in a creative process	Interview
Park and Kim (2013)	Book-making activities; music listening	5-year-old children	Enhanced creative attitudes (curiosity, adventurousness, goal orientation, independence, and openness)	Experiments
Parker (2008)	Visual-art class	High school students	Enhanced Torrance tests of creative thinking	Experiments
Pavlou (2013)	Viewing, discussing, and making art	7- to 8-year-old children	Development of possibility thinking (the ability to make connections, think differently, envisage new possibilities, and critically reflect)	Participant observation
Sowden et al. (2015)	Art-based improvisational activities (dance class; verbal and acting games)	Primary-school-aged children	Torrance tests of creative thinking	Experiments
Wellman (2012)	Artistic assignment in a traditional lecture setting	College students	Enjoyment and self-reported creativity, originality, and individuality	Survey

recycling solutions in more creative ways, compared with those who were not exposed to art, and whether any observed creativity effects would be mediated by inspiration. We therefore predicted that the creativity-enhancing effects of art appreciation would extend to business-relevant tasks. Formally:

H3. *Exposure to works of art should enhance business-related creativity in the form of product design, brand-naming, and problem solution generation.*

4. Overview of the studies

The key objective of our research was to empirically assess whether appreciating works of art generated inspiration and thereby enhanced creativity. In particular, this research focused on the mediating role of inspiration in the relationship between art appreciation and creativity.

The results of four studies provided support for our hypotheses. In each study, we employed various measures or manipulations of art appreciation (dispositional openness to aesthetics in Study 1, recall of past experiences of appreciation of artworks in Study 2, and appreciation of paintings and poetic lyrics in Studies 3a and 3b) as triggers of inspiration. In order to test H1, in Study 1, we compared participants with high versus low openness to aesthetic experiences and examined whether greater openness toward experiencing works of art led to greater inspiration and, thus, greater creativity. To measure participants' chronic dispositional attitudes toward appreciating aesthetics and experiencing artworks, we used an openness-to-aesthetics scale. In Study 2, we compared consumers who recalled experiencing works of art with those who recalled their typical daily lives and examined whether inspiration mediated the effect of experiencing works of art on creativity, in line with H2. Finally, Studies 3a and 3b examined more closely the effect of art appreciation on business-related problem-solving capability, providing a test of H3. This effect of art appreciation was applied to problem solving in business-relevant tasks concerning product design, brand-naming, and recycling solution generation, confirming the robustness of the inspirational power of art on consumer creativity and domain-generalizability of art induced creativity (see Fig. 1 and Table 2).

5. Study 1

The goal of Study 1 was to show how openness toward aesthetics, inspiration, and creativity are positively correlated. We also tried to rule out alternative explanations for the effect by testing positive mood, engagement, and activation as potential mediators. Aesthetic experiences are in general pleasant, so they can elicit positive mood. Positive mood has been shown to be a significant facilitator of flexible thinking, which enhances divergent thinking ability (De Dreu, Baas, & Nijstad, 2008). Moreover, aesthetic experiences are often engaging, and engagement might increase creative performance by increasing concentration and motivation (Higgins, 2006). Additionally, it has been shown that activation influences creativity by helping individuals generate more alternative ideas and connect information (De Dreu et al., 2008).

5.1. Procedure

Eighty undergraduate students (average age = 23 years; 29 females) first completed the Revised NEO Personality Inventory's 8-item Openness to Aesthetics subscale (Costa & McCrae, 1992; e.g., "I am intrigued by patterns I find in art and nature"; 1 = *strongly disagree*, 7 = *strongly agree*), our measure of the extent to which participants were inclined to experience works of art in general. Afterward, we had them report their everyday levels of inspiration using the 8-item frequency and intensity subscales of the Inspiration Scale (Thrash & Elliot, 2003; e.g., "I experience inspiration: 1. How often does this happen? 2. How strongly does this happen?"; 1 = *never/not strong at all*, 7 = *very*



Fig. 1. Research model.

often/very strong) to assess the extent to which they frequently and strongly felt inspiration in their daily lives. Then, participants responded to the 10-item Positive Affect subscale of the Positive Affect and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), indicating the degree to which they felt various positive emotions (e.g., “interested” and “excited”) at the present time using a 5-point scale (1 = *not at all*, 5 = *very strongly*).

Next, to assess creativity, we asked participants to engage in an idea-generation task in which they generated as many alternative uses for a brick as possible (Mumford, 2001). Idea-generation tasks have been used to measure (primarily divergent) creative thinking for several decades (Runco, 2014). In addition, participants completed 9-item Remote Associates Tests (RAT; Mednick, 1962), in which they were presented with three unrelated words and had to think of a common word associated with all three. For example, participants might be presented with the words “car,” “swimming,” and “cue,” and the correct response would be “pool.” The RAT items thus assessed the creative ability to identify associations among things that are not normally associated with each other (Gilhooly & Murphy, 2005; Harkins, 2006) and convergent creative thinking—that is, individuals’ ability to develop one possible solution to a particular problem (Mednick, 1962). Participants were given 3 min to complete each task.

Then, we assessed participants’ activation using 2 items (“alert” and “attentive”; Baas, De Dreu, & Nijstad, 2011; 1 = *not at all*, 7 = *very strongly*) and their engagement using 1 item (“interested”; Higgins, 2006; 1 = *not at all*, 7 = *very strongly*). Finally, participants responded to some miscellaneous questions, including demographic measures, and were thanked and debriefed.

5.2. Results

To measure creativity, we counted the total number of alternative uses of a brick that each participant generated (called “fluency”; Mumford, 2001). In addition, we counted the number of original ideas for each participant by compiling the ideas generated by all participants, then counting how often each idea was mentioned by all participants, and finally counting for each participant the number of unique ideas that had been mentioned less frequently across all participants (called “originality”; Baas et al., 2011; Rietzschel, De Dreu, & Nijstad, 2007). Finally, we created RAT scores by counting the total number of correct answers for the 9 items.

Mediation analysis using a series of regressions (Baron & Kenny, 1986) and PROCESS Model 4 (Hayes, 2013) indicated that inspiration

mediated the effect of openness to aesthetics on creativity (see Fig. 2). We also ruled out positive mood, engagement, and activation as alternative explanations for the effect of openness to aesthetics on creativity, by testing as potential mediators (see Appendix A).

5.3. Discussion

In Study 1, we showed that individuals with higher openness to aesthetic experiences felt more inspired in their daily lives and in turn performed better on creativity tasks. Openness to aesthetics had a direct effect on one of the creativity measures—the total number of ideas generated—which was consistent with the findings of prior research (Griffin & McDermott, 1998). We also replicated Thrash and Elliot’s (2003, 2004) finding that inspiration significantly influenced creativity. In sum, replicating and extending prior findings, we found that the path between openness to aesthetics and creativity was mediated by inspiration using diverse measures of creativity (total number of ideas generated, number of original ideas generated, and RAT scores). The null effects of positive mood, activation, and engagement on creativity helped to rule out alternative explanations for the observed effect. Study 1 was correlational, so its results could not distinguish the causal direction of this association—whether openness to aesthetics affected creativity, or creative individuals simply tended to be open to aesthetics. Thus, we manipulated participants’ experience of art in Study 2.

6. Study 2

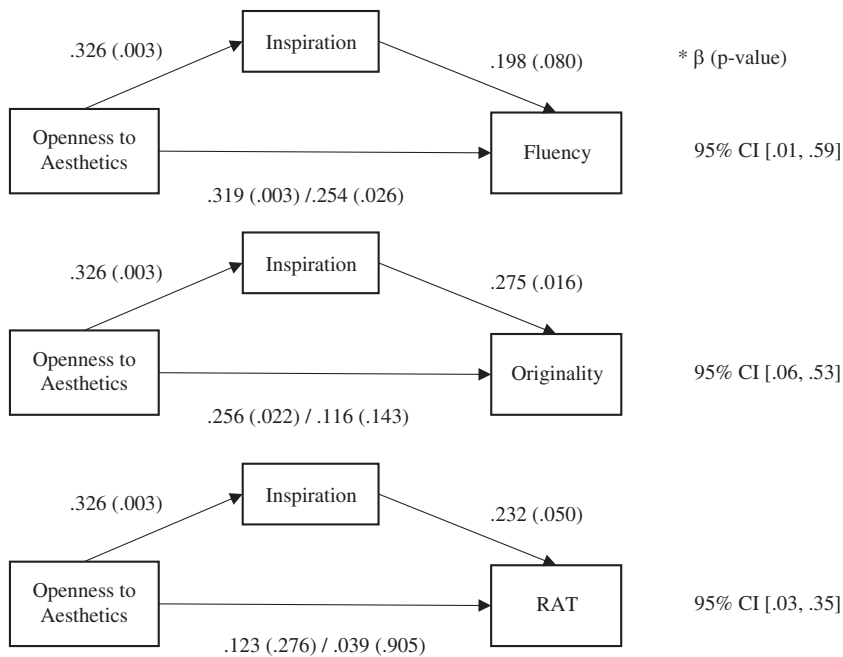
The objective of Study 2 was to test the robustness of the mediating effect of inspiration. We designed Study 2 to be different from Study 1 in three ways. First, we manipulated aesthetic experience by asking participants to write about a time they had experienced works of art. Second, we measured inspiration using items associated with evocation, transcendence, and motivation, consistent with Thrash et al. (2010)’s tripartite conceptualization of inspiration. Third, we used participants’ endorsements of creative personality adjectives (Gough, 1979) as a measure of creativity.

6.1. Procedure

Sixty-two undergraduates (average age = 23 years; 31 females) were randomly assigned to one of two conditions. Participants in the experimental condition were asked to recall and describe an episode during which they had experienced works of art. (Exact instructions

Table 2
Overview of studies.

Study	Model	Independent variable	Dependent variable(s)	Mediator	Other aspects
1	Openness to aesthetic experience → Inspiration → Creativity	Openness to aesthetics	Idea-generation task; RAT	Frequency and intensity of inspiration	Ruled out alternative explanations (positive affect, engagement, and activation)
2	Recall of aesthetic experience → Inspiration → Creativity	Recalling past aesthetic experience	Creative personality trait endorsement	Inspiration scale	
3a	Appreciation of art → Business creativity	Appreciating artwork (van Gogh’s paintings)	Product (Keyboard) design; brand-naming		Tested for gender effect; ruled out alternative explanation (mood)
3b	Appreciation of art → Inspiration → Business creativity	Reading poetic lyrics (“Blowin’ in the Wind” by Bob Dylan)	Recycling solution generation; brand-naming	Inspiration scale	Ruled out alternative explanations (mood, positive affect)

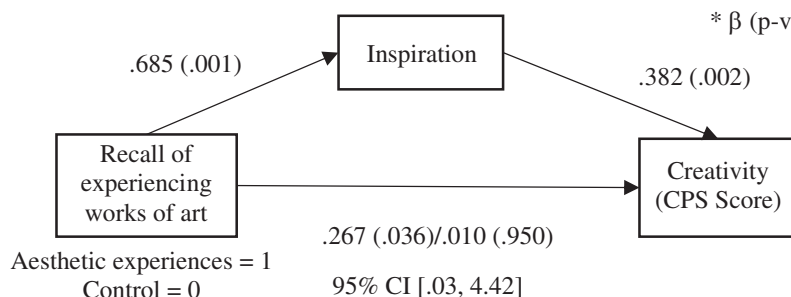


read, “Describe a time when you appreciated works of art or something aesthetic.”) In the control condition, participants were instructed to describe their typical daily lives.

After the narrative task, participants responded to a 8-item inspiration scale, which included 2 items each concerning evocation, transcendence, motivation, and general inspiration (e.g., “I felt inspired while recalling this” and “I had important insights or revelations that I strove to express”; Thrash et al., 2010; 1 = *strongly disagree*, 7 = *strongly agree*). Finally, as a measure of creativity, participants completed Gough's (1979) 30-item Creative Personality Scale (CPS), which asked them to describe their current self by selecting any of 18 positively scored (e.g., “wide interests,” “self-confident,” “humorous”) or 12 negatively scored items (e.g., “conventional,” “cautious,” “commonplace”). We summed scores for the 30 items to form a CPS score. We chose this scale as a measure of creativity because it is widely used and regarded as highly reliable (Charyton & Snelbecker, 2007; Oldham & Cummings, 1996).

6.2. Results

Participants in the experimental condition had higher CPS scores than those in the control condition, and participants who recalled experiencing art were more inspired than those who recalled their typical daily lives. The indirect effect of recalling experiencing works of art on creativity through inspiration was significant (see Fig. 3 and Appendix A).



6.3. Discussion

Study 2 showed that participants who recalled experiencing works of art felt more inspiration and identified themselves as having more creative personalities, relative to those who recalled a typical day, providing support for H2. Study 2 also replicated findings from prior literature showing that experiencing art can transform individuals' self-perception (Djickic, Oatley, Zoeterman, & Peterson, 2009) and that individuals' everyday levels of inspiration are positively related to self-reported creativity (Thrash & Elliot, 2003).

7. Study 3a

One objective of Study 3 was to investigate whether the effects of art appreciation on creative traits and creative-task performance in the previous studies would transfer to business-relevant contexts. The second objective was to test the effect of art appreciation directly by actually exposing participants to paintings or poetic lyrics.

7.1. Procedure

Ninety-four business school undergraduates (average age = 20 years; 47 females) were randomly assigned to one of two conditions. They were told that they would be completing a series of surveys. Participants in the experimental condition were asked to freely look through the nine prints of artworks painted by Vincent van Gogh for 3 min, including *A Pair of Shoes* and *Garden of the Hospital in Arles* (see Appendix A), and were told that the experimenter was interested in

their opinion of the paintings. Participants in the control condition were asked to freely look through nine photographs depicting objects and landscapes analogous to those featured in the van Gogh paintings. For example, we used a photograph of the garden of space van Gogh in Arles taken at the same place where the *Garden of the Hospital in Arles* was painted.

After they had finished viewing the paintings or the photographs, we asked participants to engage in solving practical problems of product design and brand-naming. First, participants were asked to brainstorm design ideas for a new computer keyboard within 3 min (Mehta & Zhu, 2016; Experiment 6). Next, they were asked to list as many creative brand names as possible for a new kind of pasta product within 3 min (De Dreu et al., 2014; Steffens, Gocłowska, Cruwys, & Galinsky, 2016). These two creativity tasks were chosen because they were highly relevant to the actual process of new product development.

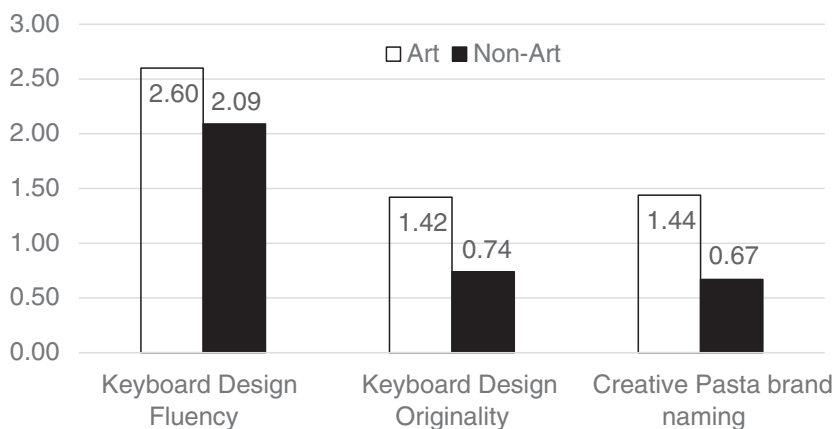
Finally, participants responded to 4 items measuring mood (1 = *sad, unpleasant, negative mood, bad mood*; 7 = *happy, pleasant, positive mood, good mood*) and 1 item measuring arousal (1 = *not at all aroused*; 7 = *aroused*). Despite the nonsignificance of mood effects in relation to art's effect on creativity in Study 1, we again included mood measures in Study 3 because we employed a different aesthetic-experience manipulation and stimuli, and the contents of the paintings and photographs used as stimuli could have induced particular mood states.

7.2. Results

To measure creativity, as in Study 1, we counted the total number of design ideas (fluency) and the number of original design ideas that each participant generated (originality). In addition, we scored the pasta task by counting creative pasta names consistent with prior research (De Dreu et al., 2014; Steffens et al., 2016). We found a significant effect of the manipulation on the total number of ideas generated, on the originality of participants' design ideas and on their creativity in the pasta-naming task (see Fig. 4 and Appendix A).

8. Study 3b

Study 3b was designed to further test the mediating effect of inspiration on creativity in a business-relevant context. In this study, we used a different manipulation of art appreciation (reading poetic lyrics) and a different workplace creativity task (recycling solution generation) in addition to brand-naming as a measure of business creativity.



$$F(1, 91) = 4.57, p = .035 \quad F(1, 91) = 7.57, p = .012 \quad F(1, 91) = 4.32, p = .041$$

8.1. Procedure

Seventy-nine business school students (average age = 22 years; 31 females) were randomly assigned to one of two conditions. Participants in the experimental condition were asked to read the lyrics of Bob Dylan's "Blowin' in the Wind" and then were given 3 min to write down the thoughts and feelings they experienced while reading it. Participants in the control condition were asked to write about their typical daily lives for 3 min. After the writing task, participants responded to the same 8 items from the Inspiration Scale used in Study 2. Next, participants were presented with an ostensibly unrelated task in which they were asked to generate creative ideas to solve a recycling problem faced by their school (Mehta & Zhu, 2016; Experiment 4). Specifically, they were asked to come up with ways to recycle about 250 cases of bubble wrap packaging material left behind after a moving company relocated the school's computer labs. In addition, we asked participants to complete the same pasta brand-naming task used in Study 3a. After completing the two creativity tasks, participants responded to the same 4 mood items used in Study 3a and the same 10 PANAS items measuring positive affect used in Study 1, as well as some demographic questions. Then, they were thanked and debriefed.

8.2. Results

PROCESS Model 4 with 5000 samples confirmed significant indirect effects, through inspiration, of reading poetic lyrics on the total number of ideas generated (fluency) and on the originality of recycling solutions and creativity in brand-name generation (see Fig. 5).

8.3. Discussion

In Studies 3a and 3b, we extended the effect of art appreciation to creative solution generation in business-relevant contexts and found further support for our hypotheses. The results of Study 3a demonstrated that viewing masterpieces painted by van Gogh led participants to show greater creativity in developing new designs for a computer keyboard and in generating new brand names. Study 3b showed that reading poetic song lyrics induced inspiration, which led participants to generate more creative solutions for recycling packaging materials as well as more creative brand names. These results imply that creativity induced through art may transcend domains and transfer to workplace environments through inspiration.

9. Conclusion

The studies reported here provide clear evidence that appreciating

Fig. 4. Results in Study 3a.

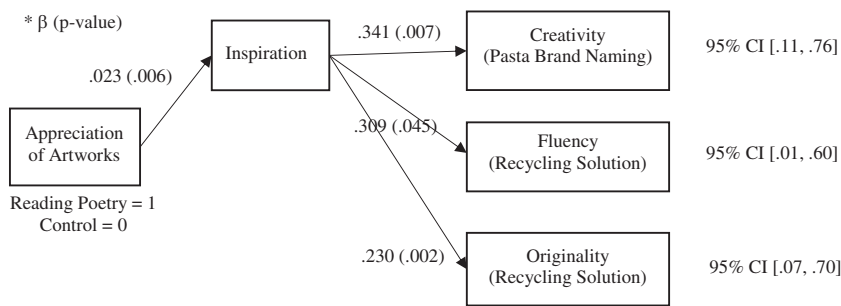


Fig. 5. Tested model in Study 3b.

art induces inspiration, which in turn facilitates performance on creative tasks. We found support for our theory using several different measures of creativity—idea-generation tasks, RAT, and endorsement of creative personality traits. Moreover, the effect of art appreciation was robust across various contexts. In Study 1, individuals with higher openness toward aesthetics were inspired more frequently and deeply in their daily lives and showed greater creativity in an idea-generation task and RAT. Recalling personal episodes of experiencing works of art generated greater inspiration and creativity compared to recalling typical daily life in Study 2. Studies 3a and 3b confirmed the robustness of our findings by showing that the observed effects applied to creative idea generation in practical, business-relevant tasks. Moreover, we ruled out alternative explanations for the effects of art appreciation (positive mood, activation, engagement, and energetic arousal), supporting the mediating effect of inspiration.

Our research theoretically contributes to the literature on the effects of art on creativity by highlighting the inspiration triggered by works of art as an important mediator facilitating creative cognition. Earlier research on creativity-inducing art interventions was grounded more in practical settings, such as art-based curricula and art intervention programs in schools and firms, where it might be difficult to control for the confounding effects of other environmental factors. The current research investigated the effects of art in experimental settings, where the mediation and main effects could be established by ruling out possible alternative explanations.

Our work suggests additional questions to be answered by future research. For example, is the inspirational effect of art short-lived, or can it last over the long term? The inspirational effect on creativity we observed a few minutes after priming art appreciation might dissipate with time; alternatively, it might last longer and, potentially, be stronger when triggered in real-world settings, such as within art museums or organizations. Future research should thus examine how well the effect of art appreciation applies outside the lab. Though we used various methods to measure creativity that could be considered practical in the experimental contexts, examining whether participants transformed their creative ideas into actual creative products was beyond the scope of our studies. Analyses of archival or secondary field data on creative outcomes based on real product assessments—for

example, analyses of patent data—would allow researchers to examine creative idea actualization. Additionally, we suggest that future research should investigate whether different fields of art such as literature, music, and painting trigger different kinds of creativity—for instance, convergent versus divergent thinking. Leder, Gerger, Dressler, and Schabmann (2012) reported expertise-related differences in the aesthetic appreciation of classical, abstract, and modern art. We did not distinguish among types of art (e.g., visual art vs. music) in Study 2 when asking participants to recall experiencing art, and it is possible that the different types of art recalled had different effects on participants' creativity. Further, future research can address whether individual differences, such as in art-related knowledge (Leder et al., 2012), personal characteristics, and past experiences (Tinio, 2013), or societal and historical factors such as current trends (Jacobsen, 2006; Tinio, 2013) promote or preclude the effect of inspiration on creativity while people are appreciating art.

Our findings suggest several practical implications. The results strongly imply that art-based curricula or the art intervention programs increasingly practiced in companies can be highly effective for enhancing workplace and consumer creativity. Thus, we suggest that firms should employ more art-related creativity training programs to increase their employees' creative problem-solving abilities, especially in the context of new product development. Most U.S. firms do not provide any type of formal creativity training for employees working in key areas of innovation such as new product design (Burroughs et al., 2011). Our results show that simply displaying art in the work environment could enhance employees' creative capabilities, thereby driving innovation.

Conflicts of interest

None.

Acknowledgment

This work was supported by the National Research Foundation of Korea grant funded by the Korean Government (NRF-2017066512).

Appendix A. Supplemental analyses

A.1. Study 1: mediation effect of inspiration and ruling out alternative explanations

A bootstrap procedure using PROCESS Model 4 (Hayes, 2013) with 5000 samples confirmed that the indirect effects were all significant—total number of ideas generated: 95% confidence interval (CI) = [0.01, 0.59]; number of original ideas generated: 95% CI = [0.06, 0.53]; RAT scores: 95% CI = [0.03, 0.35].

Mediation analysis using a series of regressions showed that openness to aesthetics significantly predicted positive affect ($p = 0.015$), but positive affect did not increase the total number of ideas generated ($p = 0.310$), the number of original ideas generated ($p = 0.159$), or RAT scores ($p = 0.841$). In addition, openness to aesthetics positively influenced activation ($p = 0.005$) and engagement ($p = 0.005$). However, the effect of activation was not significant on any of the measures of creativity ($ps > 0.454$). Engagement did not predict creativity scores ($ps > 0.074$). Hayes' PROCESS Model 4 generated the 95% CIs based on 5000 bootstrap samples and they all included zero, confirming that the indirect effects through positive affect, activation, and engagement on creativity scores were all nonsignificant.

A.2. Study 2: the effect of recalling experience of art on inspiration and creativity

A one-way ANOVA yielded a significant effect of recalling experiencing works of art on creativity, $F(1, 60) = 4.60, p = 0.036$. Participants in the experimental condition had higher CPS scores ($M = 4.86$) than those in the control condition ($M = 2.45$). The manipulation had a significant effect on participants' inspiration scores, $F(1, 60) = 52.92, p < 0.001$. Participants who recalled experiencing art were more inspired ($M = 4.55$) than those who recalled their typical daily lives ($M = 2.86$).

A.3. Study 3a: Ruling out alternative explanations

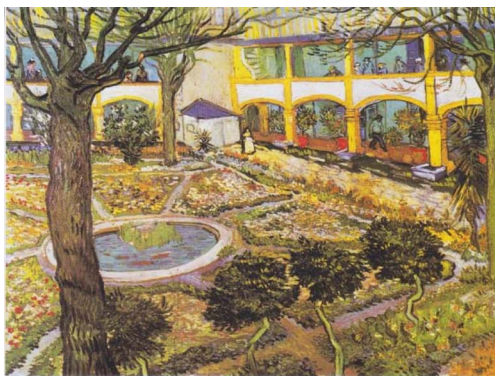
A one-way analysis of covariance (ANCOVA) including gender as a covariate revealed a significant effect of the manipulation on the total number of ideas generated, but no significant effect of gender, $F(1, 91) = 2.21, p = 0.141$. We tested for a gender effect because of possible gender differences in art appreciation (Baer & Kaufman, 2005; Cramond, 1994). ANCOVAs revealed the predicted main effects of condition on the originality of participants' design ideas and on their creativity in the pasta-naming task, again with no significant gender effect (see Fig. 4). An ANCOVA revealed no significant differences in mood, $F(1, 90) = 0.48, p = 0.621$, or arousal, $F(1, 91) = 0.35, p = 0.709$, between the experimental and control conditions.

A.4. Study 3b: ruling out alternative explanations

Results revealed no significant indirect effects on the originality of recycling solution generation through positive affect (95% CI = $[-0.29, 0.14]$) or mood (95% CI = $[-0.03, 0.48]$) or on creativity in pasta brand-naming through positive affect (95% CI = $[-0.25, 0.15]$) or mood (95% CI = $[-0.32, 0.05]$).

Appendix B. Study 3a stimuli examples

Experiment condition



Control condition



References

- Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, 45(2), 357.
- Artlab (2009). Artlabdk. Retrieved 12 Dec, 2015, from http://artlab.dk/wp-content/uploads/2012/09/artlabcases_uk.pdf.
- Baas, M., De Dreu, C. K., & Nijstad, B. A. (2011). When prevention promotes creativity: The role of mood, regulatory focus, and regulatory closure. *Journal of Personality and Social Psychology*, 100(5), 794–809.
- Baer, J. (1998). The case for domain specificity of creativity. *Creativity Research Journal*, 11(2), 173–177.
- Baer, J. (2010). Is creativity domain specific? In J. C. Kaufman, & R. J. Sternberg (Eds.). *The Cambridge handbook of creativity* (pp. 321–341). Cambridge University Press: New York.
- Baer, J., & Kaufman, J. C. (2005). Bridging generality and specificity: The amusement park theoretical (APT) model of creativity. *Roeper Review*, 27(3), 158–163.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Berthoin Antal, A., & Strauß, A. (2013). Artistic interventions in organisations: Finding evidence of values-added. *Creative clash report*. Berlin: WZB.
- Brinkmann, A., & Sriraman, B. (2009). Aesthetics and creativity: An exploration of the relationship between the constructs. In B. Sriraman, & S. Goodchild (Eds.). *Festschrift celebrating Paul Ernest's 65th birthday* (pp. 57–80). Charlotte, NC: Information Age Publishing.
- Boyle, M. E., & Ottensmeyer, E. (2005). Solving business problems through the creative power of the arts: Catalyzing change at Unilever. *Journal of Business Strategy*, 26(5), 14–21.
- Burroughs, J. E., Dahl, D. W., Moreau, C. P., Chattopadhyay, A., & Gorn, G. J. (2011). Facilitating and rewarding creativity during new product development. *Journal of Marketing*, 75(4), 53–67.
- Burton, J., Horowitz, R., & Abeles, H. (1999). Learning in and through the arts: Curriculum implication. In E. Fiske (Ed.). *Champions of change: The impact of the arts of learning* (pp. 35–46). Washington DC: Arts Education Partnership.
- Charyton, C., & Snelbecker, G. E. (2007). General, artistic and scientific creativity attributes of engineering and music students. *Creativity Research Journal*, 19(2–3), 213–225.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five Factor Inventory (NEO-FFI) professional manual*. Odessa: Psychological Assessment Resources.
- Cote, J. (2008). Arts-based education and creativity. In C. J. Craig, & L. F. Deretchin (Eds.). *Cultivating curious and creative minds: The role of teachers and teacher educators: Part II* (pp. 126–143). UK: Rowan & Littlefield Education.
- Cramond, B. (1994). The Torrance tests of creative thinking: From design through establishment of predictive validity. In R. R. Subotnik, & K. D. Arnold (Eds.). *Beyond Terman: Contemporary longitudinal studies of giftedness and talent* (pp. 229–254). Norwood, NJ: Ablex.
- De Dreu, C. K. W., Baas, M., & Nijstad, B. A. (2008). Hedonic tone and activation level in the mood-creativity link: Toward a dual pathway to creativity model. *Journal of Personality and Social Psychology*, 94(5), 739–756.
- De Dreu, C. K., Baas, M., Roskes, M., Sligte, D. J., Ebstein, R. P., Chew, S. H., & Shamay-Tsoory, S. G. (2014). Oxytonergic circuitry sustains and enables creative cognition in humans. *Social Cognitive and Affective Neuroscience*, 9, 1159–1165.
- Dewey, J. (1989). Having an experience. In J. A. Boydston (Ed.). *John Dewey: The later works, 1925–1953: Art as experience* (pp. 42–63). Carbondale: Southern Illinois University Press.
- Djicic, M., Oatley, K., Zoeterman, S., & Peterson, J. B. (2009). On being moved by art:

- How reading fiction transforms the self. *Creativity Research Journal*, 21(1), 24–29.
- Eriksson, M. (2009). Expanding your comfort zone. The effects of artistic and cultural intervention on the workplace. *Institute for management of innovation and technology. Working paper*. Retrieved from http://old.tilt.se/download/AIRIS_pdf/IMIT_REPORT_AIRIS.pdf, Accessed date: 1 December 2016.
- Feist, G. J., & Brady, T. R. (2004). Openness to experience, non-conformity, and the preference for abstract art. *Empirical Studies of the Arts*, 22(1), 77–89.
- Furnham, A., & Avison, M. (1997). Personality and preference for surreal paintings. *Personality and Individual Differences*, 23(6), 923–935.
- George, J. M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology*, 86, 513–524.
- Gilhooly, K. J., & Murphy, P. (2005). Differentiating insight from non-insight problems. *Thinking & Reasoning*, 11(3), 279–302.
- Gough, H. G. (1979). A creative personality scale for the adjective check list. *Journal of Personality and Social Psychology*, 37(8), 1398–1405.
- Griffin, M., & McDermott, M. R. (1998). Exploring a tripartite relationship between rebelliousness, openness to experience and creativity. *Social Behavior and Personality: An International Journal*, 26(4), 347–356.
- Guetzkow, J. (2002). How the arts impact communities. Proceedings of the taking the measure of culture conference of the centre for arts and cultural policy studies. *Working paper*. New Jersey, Princeton: CACP.
- Guilford, J. P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.
- Harkins, S. G. (2006). Mere effort as the mediator of the evaluation-performance relationship. *Journal of Personality and Social Psychology*, 91(3), 436.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. New York: Guilford Press.
- Higgins, E. T. (2006). Value from hedonic experience and engagement. *Psychological Review*, 113(3), 439.
- Hirschman, E. C. (1980). Innovativeness, novelty seeking, and consumer creativity. *Journal of Consumer Research*, 7(3), 283–295.
- Jacobsen, T. (2006). Bridging the arts and sciences: A framework for the psychology of aesthetics. *Leonardo*, 39, 155–162.
- James, K., Brodersen, M., & Jacob, E. (2004). Workplace affect and workplace creativity: A review and preliminary model. *Human Performance*, 17, 169–194.
- Karakelle, S. (2009). Enhancing fluent and flexible thinking through the creative drama process. *Thinking Skills and Creativity*, 4(2), 124–129.
- Katz-Buonincontro, J. (2008). Can the arts assist in developing the creativity of educational leaders? *The International Journal of Creativity & Problem Solving*, 18(2), 69–79.
- Kerr, C., & Lloyd, C. (2008). Pedagogical learnings for management education: Developing creativity and innovation. *Journal of Management and Organization*, 14(5), 486.
- Leder, H., Gerger, G., Dressler, S. G., & Schabmann, A. (2012). How art is appreciated. *Psychology of Aesthetics, Creativity, and the Arts*, 6(1), 2.
- McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*, 52(6), 1258–1265.
- McCrae, R. R., & Costa, P. T., Jr. (1997). Personality trait structure as a human universal. *American Psychologist*, 52(5), 509–516.
- Mednick, S. (1962). The associative basis of the creative process. *Psychological Review*, 69(3), 220–232.
- Mehta, R., & Zhu, M. (2016). Creating when you have less: The impact of resource scarcity on product use creativity. *Journal of Consumer Research*, 42(5), 767–782.
- Miller, W. R., & C'Debaca, J. (1994). Quantum change: Towards a psychology of transformation. In T. F. Heatherton, & J. L. Weinberger (Eds.). *Can personality change?* (pp. 253–280). Washington, DC: American Psychological Association.
- Milyavskaya, M., Ianakieva, I., Foxen-Craft, E., Colantuoni, A., & Koestner, R. (2012). Inspired to get there: The effects of trait and goal inspiration on goal progress. *Personality and Individual Differences*, 52(1), 56–60.
- Mumford, M. D. (2001). Something old, something new: Revisiting Guilford's conception of creative problem solving. *Creativity Research Journal*, 13(3–4), 267–276.
- Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39(3), 607–634.
- Oleynick, V. C., Thrash, T. M., LeFevre, M. C., Moldovan, E. G., & Kieffaber, P. D. (2014). The scientific study of inspiration in the creative process: Challenges and opportunities. *Frontiers in Human Neuroscience*, 8, 436–444.
- Park, H. S., & Kim, J. J. (2013). The effects of book-making activities with music-listening on young children's creativity and character. *International Journal of Early Childhood Education*, 19(1), 45–65.
- Parker, J. (2008). *The impact of visual art instruction on student creativity*. Michigan: ProQuest.
- Pavlou, V. (2013). Investigating interrelations in visual arts education: Aesthetic enquiry, possibility thinking and creativity. *International Journal of Education through Art*, 9(1), 71–88.
- Plucker, J. A. (1998). Beware of simple conclusions: The case for content generality of creativity. *Creativity Research Journal*, 11(2), 179–182.
- Rawlings, D., Barrantes, i., Vidal, N., & Furnham, A. (2000). Personality and aesthetic preference in Spain and England: Two studies relating sensation seeking and openness to experience to liking for paintings and music. *European Journal of Personality*, 14(6), 553–576.
- Rietzschel, E. F., De Dreu, C. K., & Nijstad, B. A. (2007). Personal need for structure and creative performance: The moderating influence of fear of invalidity. *Personality and Social Psychology Bulletin*, 33(6), 855–866.
- Runco, M. A. (2014). *Creativity: Theories and themes: Research, development, and practice*. Elsevier.
- Sowden, P. T., Clements, L., Redlich, C., & Lewis, C. (2015). Improvisation facilitates divergent thinking and creativity: Realizing a benefit of primary school arts education. *Psychology of Aesthetics, Creativity, and the Arts*, 9(2), 128.
- Steffens, N. K., Gocłowska, M. A., Cruwys, T., & Galinsky, A. D. (2016). How multiple social identities are related to creativity. *Personality and Social Psychology Bulletin*, 42(2), 188–203.
- Styhre, A., & Eriksson, M. (2008). Bring in the arts and get the creativity for free: A study of the artists in residence project. *Creativity and Innovation Management*, 17(1), 47–57.
- Thrash, T. M., & Elliot, A. J. (2003). Inspiration as a psychological construct. *Journal of Personality and Social Psychology*, 84(4), 871–889.
- Thrash, T. M., & Elliot, A. J. (2004). Inspiration: Core characteristics, component processes, antecedents, and function. *Journal of Personality and Social Psychology*, 87(6), 957–973.
- Thrash, T. M., Maruskin, L. A., Cassidy, S. E., Fryer, J. W., & Ryan, R. M. (2010). Mediating between the muse and the masses: Inspiration and the actualization of creative ideas. *Journal of Personality and Social Psychology*, 98(3), 469–487.
- Tinio, P. P. (2013). From artistic creation to aesthetic reception: The mirror model of art. *Psychology of Aesthetics, Creativity, and the Arts*, 7(3), 265.
- van den Broeck, H., Cools, E., & Maenhout, T. (2008). A case study of arteconomy building a bridge between art and enterprise: Belgian businesses stimulate creativity and innovation through art. *Journal of Management & Organization*, 14(5), 573–587.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Wellman, A. (2012). The art of the matter: The importance of using art in college classroom to promote creativity and reinforce lessons. *Open Education journal*, 5, 27–33.

Donghy An is a graduate of Master program at the Department of Culture and Arts Management at Hongik University. She obtained her bachelor's degree in the department of painting at Hongik University. Her research interests include consumer behavior, creativity, pro-social behavior, corporate art supports and aesthetic experience.

Nara Youn is a professor of marketing at Hongik University Business School. Her research interests are in the areas of creativity, aesthetics, sensory perception, innovation diffusion, and social networks. She has published in various outlets, including *Marketing Science* and *Information Systems Research*.