Your Soul Spills Out:
The Creative Act Feels Self-Disclosing

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Abstract

Breaking from the typical focus on the antecedents of creativity, we investigate the psychological and interpersonal consequences of being creative. Across five experiments, we find that generating creative ideas is revealing of the self and thus prompts the perception of self-disclosure. Individuals respond to the expectation to be creative with greater self-focus—adopting their own idiosyncratic perspective on the task and thinking about their own personal preferences and experiences in connection to the problem. Because creative ideas derived from self-focused attention are uniquely personal, the act of sharing a creative idea is, in turn, perceived to be revealing of the self. Finally, an interactive dyad study shows that sharing creative ideas makes partners more confident in the accuracy of judgments they made about each other's personality. We discuss the implications of our findings for future research investigating the consequences of creativity.

Keywords: Creativity; Idea Sharing; Self-Disclosure; Person Perception

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"Paintings have a life of their own that derives from the painter's soul." Vincent Van Gogh

Creativity, from the development of new technology to breakthroughs in science and commerce, is a process that involves not only thinking of, but also openly expressing novel and appropriate ideas (Paulus & Nijstad, 2003; Sawyer & DeZutter, 2009; Uzzi & Spiro, 2005). Though individuals might privately hold highly creative solutions, those breakthrough ideas might go unexpressed because people fear rejection and they are hesitant to share ideas that might generate controversy or criticism (Camacho & Paulus, 1995; Diehl & Stroebe, 1987). For this reason, a large and growing stream of research over the last three decades has addressed the question of how we can encourage individuals to freely share their creative ideas (Paulus, Dzindolet & Kohn, 2012; Reiter-Palmon, Wigert & de Vreede, 2012).

While creative output is clearly important, this singular focus on the variables that boost creativity might come at the cost of exploring the psychological and interpersonal consequences of sharing creative ideas (Goncalo, Vincent & Krause, 2015; Sassenberg & Moskowitz, 2005; Wronska, Kolańczyk & Nijstad, 2018; Khessina, Goncalo & Krause, 2018). Rather than focusing on the antecedents of creative ideation, we turn instead to consider an important but as yet unexamined consequence of idea sharing. Specifically, we suggest the act of sharing creative ideas is revealing of the self and thus leads to the perception of self-disclosure. This novel connection between creativity and self-disclosure has numerous theoretical and practical implications for research in clinical (Henry & Strupp, 1994), social (Collins & Miller, 1994; Reis & Shaver, 1988) and organizational psychology (Phillips, Rothbard & Dumas, 2009; Polzer,

Milton & Swann, 2002), because self-disclosure elicited in the process of creative ideation might provide the foundation for bonding, intimacy, and social connectedness (Collins & Miller, 1994; Laurenceau, Barrett & Pietromonaco, 1998; Reis & Shaver, 1988).

Risky Business: Creativity and Self-Disclosure

Self-disclosure is defined as personal information verbally communicated to another individual (Chelune, 1979; Cozby, 1973; Wheeless & Grotz, 1976). In prior research, self-disclosure has been limited to verbal as opposed to non-verbal interaction that can include both oral and written communication (Omarzu, 2000). Individuals may choose to disclose a wide range of personal information during an encounter such as descriptive information about themselves (e.g. I was born in the U.S.), evaluative information about their attitudes, values or beliefs (e.g. I favor gun control), or affective information about their moods and emotions (e.g. I'm ashamed) (Morton, 1978).

This wide array of information can also vary along several important dimensions (Cozby, 1973). Breadth of self-disclosure refers to the number of different domains covered when an individual shares personal information (Jones & Archer, 1976). Duration of self-disclosure is the sheer amount or persistence and time spent sharing personal information (Chelune, 1979). And, depth of self-disclosure describes the intimacy level of the personal information shared (Altman & Taylor, 1973), where intimacy means that the information shared is emotionally intense or potentially embarrassing (Howell & Conway, 1990).

Sharing personal information is interpersonally risky and might lead to rejection. Baxter and Montgomery (1996) outlined several potential risks to self-disclosure. An individual who discloses personal information could be rejected by the listener and rejection could cause hurt and embarrassment. Sharing personal information can also limit one's autonomy and personal

integrity. Once personal information is shared, it cannot be retracted, which might also contribute to a loss of control over potentially sensitive information that might make a person feel vulnerable. Finally, a failed attempt at self-disclosure stemming from the inability to articulate one's thoughts clearly could also lead to a distorted impression that could persist and impact relationships over time (Kelly & McKillop, 1996). For these reasons, self-disclosure is more likely to occur when individuals feel anonymous or liberated from social desirability concerns (McKenna & Bargh, 2000; Walther, 1996).

Balanced against the risks of self-disclosure are potential rewards such as increased intimacy and liking between partners (Collins & Miller, 1994; Laurenceau, Barrett & Pietromonaco, 1998). The gradual disclosure of personal information can draw a desired partner into a closer relationship (Reis & Shaver, 1988; Birnbaum et al, 2017). Taking this tradeoff into account, self-disclosure has been modeled as a decision-making process in which people weigh both the risks and potential rewards of disclosure before choosing whether and how much to disclose and to whom (Omarzu, 2000).

Aside from the objective amount of type of information disclosed, individuals can vary in their perceptions of having disclosed personal information. For example, partners can have different perceptions of how intimate or revealing particular information is (Wheeless & Grotz, 1976). Prior research has also shown that men and women can have different perceptions of how much each partner has disclosed. These subjective perceptions of self-disclosure are consequential because, for example, when self-disclosure patterns uphold established gender roles (e.g. women disclose more than men), both partners report greater relationship satisfaction (Millar & Millar, 1988). Thus, it is not simply objective information about what has been disclosed that matters, but also to what extent people feel as though they have disclosed.

Like self-disclosure, the decision to share a creative idea is also perceived to be an interpersonally risky act that exposes an individual to the possibility of rejection. Creative ideas are novel, untested, and unproven, making them likely to be rejected, at least initially (Mueller, Melwani & Goncalo, 2012). Because individuals fear rejection (Baumeister & Leary, 1995; DeWall & Bushman, 2011), they tend to withhold rather than express their most creative ideas and instead suggest only their most conservative and uncontroversial ideas to avoid criticism (Camacho & Paulus, 1995; Diehl & Stroebe, 1987).

Why is evaluation apprehension in the creative process so deeply rooted? Existing research on how to reduce evaluation apprehension, such as making people feel anonymous (Connolly, Jessup, Valacich, 1990), hints at an intriguing possibility. Creative ideas may not merely be potential solutions—abstract possibilities that may or may not survive an impersonal selection process (Rietzschel, Nijstad & Stroebe, 2006). Rather, a creative idea might offer a window into one's own idiosyncratic point of view of the world, making the act of sharing a creative idea one that lays bare the self. Though no direct evidence of this link exists, we investigate the possibility that sharing creative ideas produces the perception of self-disclosure.

Creativity Ideation and Self-Focus: A Pathway to Perceived Self-Disclosure

The creative process can be quasi-random as available knowledge is dispassionately combined to yield original combinations through blind variation and selective retention (Campbell, 1960; Staw, 1990; Simonton, 1999; Simonton, 2003). There are a number of inputs into the creative process, including domain relevant knowledge, expertise, and the ability to combine seemingly disparate pieces of information in a novel and appropriate way (Amabile, 1996). Likewise, in the process of brainstorming, the goal is to build upon, combine, and improve on the ideas suggested by others to reach a solution that is better than any one individual

could have come up with alone (Paulus & Yang, 2000). From this influential perspective, ideas are merely inputs that are combined through an iterative process.

Yet, for human problem solvers, the creative process might be more personal. There is a great deal of anecdotal evidence to suggest that creative people pour themselves into their work. For example, when Jack Dorsey listened to the short messages dispatched by taxi drivers he was inspired to create Twitter (Fast Company Staff, 2015). Hungarian entrepreneur, Adam Somlai-Fischer wanted to share his own media art with the world so he developed presentation software that became Prezi (Coleman, 2014). Both of these creative ideas resulted from a unique combination of elements drawn from personal experience, consistent with Richard Branson's view that, "The ideas for the best businesses tend to come from personal experience" (Branson, 2015).

These anecdotes are suggestive and revealing because they imply creative work can be personally meaningful (Amabile & Pratt, 2016). In the creative process, individuals have the latitude to decide which problems to pursue and which ideas to share or withhold based on whether they believe the problem is significant to them (Lepisto & Pratt, 2017). In order to generate creative ideas, individuals draw on and integrate their unique knowledge and experience to share solutions that reflect their own original point of view (Cheng, Sanchez-Burks & Lee, 2008; Leung, Maddux, Galinsky & Chiu, 2008). In turn, that uniquely personal perspective differentiates one's ideas from those suggested by others (Beersma & De Dreu, 2005; Goncalo & Staw, 2006; Kim, Vincent & Goncalo, 2012; Zitek & Vincent, 2015). Rather than being impersonal, creative expression is intertwined with the self. When prompted to be creative, people may reach into the aspects of the self that make them unique (Dollinger, 2003). In doing so, they might not only express creative ideas (the focus of much prior research), but the creative

ideas they share might feel personally revealing, thus prompting the perception of self-disclosure (the focus of our research).

The Present Research: The Creative Self-Disclosure Effect

In investigating the link between creativity and self-disclosure, this paper makes several important contributions. First, we break from the typical focus on the antecedents of creativity to investigate the interpersonal consequences of being creative. Second, we show for the first time that being creative feels self-disclosing—an insight that might provide a theoretical framework guiding future investigation into the downstream consequences of creativity. Third, we show that when people share creative ideas with a partner, they not only perceive they have personally disclosed, but they also feel as though their partner has disclosed to them. Perceived self-disclosure, in turn, can impact how interaction partners perceive each-other. Taken together, the present studies represent a new direction in research integrating creativity, person perception, and social cognition.

Overview of Studies

Across five experiments we test our hypothesis that generating creative ideas will prompt the perception of self-disclosure. We first show that generating creative ideas causes individuals to report stronger perceived self-disclosure compared to those who were asked to generate uncreative ideas (Experiments 1-2); a process that is mediated by a focus on the self (Experiment 3). Next, we identified and tested an important boundary condition on creative self-disclosure—restricting problem solvers to one particular idea category significantly attenuates the perception of self-disclosure (Experiment 4). Finally, we replicate and extend these findings in the context of a face-to-face interaction between partners who share their ideas with each other (Experiment 5). For each experiment, all measures, manipulations and exclusions in the experiment are

disclosed. No analyses were conducted until data collection was complete. All experiments were run with IRB approval and conformed to APA ethical standards.

Experiment 1

Participants and procedure. Given there is no prior research linking creativity to self-disclosure, we decided on a large sample size of 100 per cell, which would give 80% power to detect any effect of .4 SD or above. We recruited 202 Participants (37% male, M_{age} = 21) from a large public university who were randomly assigned to one of two idea generation conditions (creative vs uncreative). Participants read the following prompt with the wording in parentheses varied by condition (creative vs uncreative): "This next section is a task about product development. We are looking for some ideas for (new/word omitted) flavors of potato chips that are (creative, novel, and unique/ generic, conventional, and typical). We want these flavors to be as (creative, novel, and unique/ generic, conventional, and typical) as possible. Please take the next five minutes to write as many (creative, novel, and unique/generic, conventional, and typical) ideas as possible for (new/word omitted) potato chip flavors." We intentionally selected a mundane and widely used household product as the brainstorming prompt to provide a conservative test of our prediction. Discussing potato chip flavors should not be inherently revealing, given Americans eat about 1.85 billion pounds of potato chips, or about 6.6 pounds per person annually (Atwood, 2017). We also chose to compare the creative condition to an uncreative condition, rather than a control condition with no instructions, because brainstorming is so frequently used as a tool for creativity across so many different contexts, simply asking participants to brainstorm, even without instructions, would likely cue the expectation to be creative (Paulus & Yang, 2000). After participants finished brainstorming, they were asked to complete a short survey.

Measure

Self-reported creativity of ideas. As a manipulation check, participants responded to a four-item (7-point Likert response) scale about the creativity of their ideas with items as follows: "My ideas were creative", "My ideas were novel", "My ideas were unusual", "I generated a wide range of different ideas". The scale was reliable ($\alpha = .87$), so the items were averaged together.

Perceived self-disclosure. Existing measures of self-disclosure fall into one of three categories: (1) self-report inventories and self ratings, (2) observer or recipient ratings and (3) objective metrics (Chelune, 1979). Because our interest in these experiments was on the subjective judgment of the idea sharer that he or she disclosed personal information, we opted to use a self-report measure. Like other self-report measures of disclosure, we assessed self-disclosure from the perspective of the discloser which necessarily involves self-evaluation using an internalized standard (Chelune, 1979). We also needed a measure that was neutral with respect to topic so that the same measure could be used to compare results across experiments. Accordingly, we asked participants to rate their perception of self-disclosure on the following four-item scale (7 point Likert from strongly disagree to strongly agree): "My ideas reveal something about my personality", "My ideas demonstrate something about me", "My ideas indicate some of what I am like as a person", and "My ideas do not reveal anything about me" (R). The scale was reliable ($\alpha = .84$), so the items were averaged together.

Independent coding of idea creativity: As an additional cross-check to confirm that feelings of self-disclosure were based on actually generating creative ideas, two coders, who were blind to the experimental conditions and hypotheses of the study, coded each idea for creativity on a one to five scale (1 = Not at all creative; 5 = Highly creative). Because the two coders demonstrated significant agreement in their ratings of the ideas ($r = 0.73$, $p < .001$), their assessments were

averaged together. All idea scores for each participant were then averaged to create an overall creativity score for each participant.

Results

The manipulation check confirmed that participants in the creative idea generation condition rated their own ideas as significantly more creative (M = 4.79, SD = 1.21) than participants in the uncreative condition (M = 3.95, SD = 1.40), F (1, 201) = 20.54, p < .001, 95% CI = [.47, 1.20]. We also analyzed the independent coding of idea creativity as an additional cross-check of the effectiveness of the creativity instructions. As expected, participants randomly assigned to the creativity condition, generated ideas rated by evaluators as significantly more creative (M = 3.14, SD = .42) than participants assigned to the less creative condition (M = 2.32, SD = .64; $t(201) = 9.69$, p < .001), 95% CI = [.64, .99]. Regression analysis revealed that coded ratings of creativity were significantly correlated with self-report ratings of creativity, $\beta = .92$, p < .001, R = .47. And, consistent with our prediction, a regression analysis also revealed that rated creativity was significantly correlated with perceived self-disclosure $\beta = .15$, p < .001, R = .27.

Finally, confirming our hypothesis, a one-way ANOVA revealed participants who generated creative ideas reported significantly higher perceptions of self-disclosure (M = 4.37, SD = 1.19) compared to those who generated uncreative ideas (M = 3.85, SD = 1.38), F(1, 201) = 8.03, p = .0051, 95% CI = [.16, .87].

Discussion

Experiment 1 provides the first evidence that the act of generating creative ideas prompts the perception of self-disclosure. In experiment 2 our aim was to demonstrate the robustness and

replicability of the creative self-disclosure effect using a different brainstorming topic and a different participant sample.

Experiment 2

Method

Participants and procedure. We recruited 202 participants through Amazon Mechanical Turk (53% male, M_{age} = 36) who were randomly assigned to one of two conditions (Creative vs. Uncreative). Participants read the following prompt with the wording in parentheses varied by condition (creative vs uncreative): "This next section is a task about product development. We are looking for some ideas for (new/word omitted) types of scented candles that are (creative, novel, and unique/ generic, conventional, and typical). We want these scents to be as (creative, novel, and unique/ generic, conventional, and typical) as possible. Please take the next five minutes to write as many (creative, novel, and unique/generic, conventional, and typical) ideas as possible for (new/word omitted) candle scents."

Again, we deliberately selected a mundane object, the discussion of which would not be inherently self-disclosing, in order to provide a conservative test of our hypothesis. Seven out of ten households in the U.S. use scented candles and there are more than 10,000 candle scents on the market (National Candle Association, 2018), so simply discussing candle scents should not, in and of itself, be personally revealing. After participants finished brainstorming, they were asked to complete a short survey.

Measures

Creativity of ideas. Participants once again rated the creativity of their ideas using the same items as in experiment 1. The scale was once again reliable ($\alpha = .90$), so the items were averaged together.

Perceived self-disclosure. Participants rated their perceptions of self-disclosure on a four-item scale that was identical to the scale used in experiment 1. The scale was highly reliable ($\alpha = .94$), so the items were averaged together.

Independent coding of idea creativity: Following the same procedure used in Experiment 1, two coders rated each idea for creativity on a one to five scale (1 = Not at all creative; 5 = Highly creative). Because the two coders demonstrated significant agreement in their ratings of the ideas ($r = 0.71$, $p < .001$), their assessments were averaged together. All idea scores for each participant were then averaged to create an overall creativity score for each participant.

Results

The manipulation check confirmed that participants in the creative idea generation condition did rate their own ideas as significantly more creative ($M = 5.00$, $SD = 1.27$) than those in the uncreative condition ($M = 3.43$, $SD = 1.47$), $F(1, 201) = 66.07$, $p < .001$, 95% CI = [1.19, 1.96]. Also, as expected, participants randomly assigned to the creativity condition, generated ideas rated by evaluators as significantly more creative ($M = 2.72$, $SD = .56$) than participants assigned to the less creative condition ($M = 1.71$, $SD = .34$; $t (201) = 14.50$, $p < .001$), 95% CI = [.87, 1.14]. Regression analysis revealed that coded ratings of creativity were significantly correlated with self-report ratings of creativity, $\beta = 1.13$, $p < .001$, $R = .50$. And, consistent with our prediction, a regression analysis also revealed that rated creativity was significantly correlated with perceived self-disclosure, $\beta = .77$, $p < .001$, $R = .31$.

Finally, replicating the results of experiment 1 and confirming our main hypothesis, a one-way ANOVA revealed that participants randomly assigned to generate creative ideas reported significantly higher perceptions of self-disclosure ($M = 4.72$, $SD = 1.48$) than did participants who generated uncreative ideas ($M = 3.55$, $SD = 1.69$), $F(1, 201) = 27.59$, $p < .001$, 95% CI = [.74, 1.62].

Discussion

The results of experiment 2 support our hypothesis that creativity feels self-disclosing and they provide a direct replication of experiment 1 using a different idea generation prompt. A limitation of the first two experiments is that we did not directly measure the underlying psychological mechanism. Because creative ideas derived from self-focused attention are uniquely personal, the act of sharing a creative idea should feel revealing of the self. Thus, in the next experiment, we measured self-focus directly to trace the underlying mechanism behind the creative self-disclosure effect.

Experiment 3

Method

Participants and procedure. We recruited 203 participants through Amazon Mechanical Turk (56% male, $M_{age} = 34$) who were randomly assigned to one of two conditions (Creative vs. Uncreative). Participants read the same prompt as in experiment 2. After participants finished brainstorming, they were asked to complete a short survey. Seven participants were excluded for writing nonsense answers in response to the idea generation prompt, leaving a final sample of 196.

Measures

Perceived creativity of ideas. Participants rated the creativity of their ideas on the same scale employed above. The scale was highly reliable (α = .92). Having established in experiments 1-2 that the instructions to be creative actually did elicit more creative ideas and that rated creativity is significantly correlated with self-reported creativity, we did not code the ideas generated in study 3.

Perceived self-disclosure. Participants rated their perceptions of self-disclosure on the same self-disclosure scale as above. The scale was highly reliable (α = .91).

Self-Focus. Participants rated their perceptions of self-focus on the following six-item scale (7 point Likert from strongly disagree to strongly agree): "I was thinking about my own preferences", "I considered what I would want in a product", I was thinking about my own past experiences", "I was focusing on the impression I was making with my ideas", "I was focusing on my feelings during the task", and "I was thinking about what other people would want" (R). The scale was reliable (α = .81) so the items were averaged together.

Results

The manipulation check confirmed that participants in the creativity condition rated their ideas as significantly more creative (M = 4.28, SD = .92) than those in the uncreative condition (M = 2.71, SD = 1.21), $F(1, 195) = 102.6$, $p < .001$, 95% CI = [1.26, 1.87]. Confirming our main hypothesis, a one-way ANOVA revealed that participants randomly assigned to generate creative ideas reported significantly higher perceived self-disclosure (M = 4.77, SD = 1.37) than did participants who generated uncreative ideas (M = 3.64, SD = 1.66), $F(1, 195) = 26.32$, $p < .001$, 95% CI = [.69, 1.55]. Also, as expected, a one-way ANOVA revealed that participants randomly assigned to generate creative ideas reported significantly higher self-focus (M = 4.75, SD = .87)

than did participants who generated uncreative ideas ($M = 4.21$, $SD = 1.13$), $F(1, 195) = 13.56$, $p < .001$, 95% CI = [.25, .83].

We conducted a mediation analysis using the bootstrap method with 5000 samples to test the hypothesis that the relationship between creativity and perceived self-disclosure is mediated by self-focus. (Mediation Package in R, Tingley, Yamamoto, Hirose, Keele, and Imai 2013). Group condition (creative: 1 or uncreative: 0) was the independent variable in the model, while perceived self-disclosure was the dependent variable. Self-focus was the mediating variable. Results showed significant mediation: indirect effect = .54, $p < .001$, 95% CI = [.24, .85]. Once self-focus was controlled for in the model, there was still a significant direct effect = .54, $p = .002$, 95% CI = [.22, .88]. This mediation is partial (proportion mediated = .50, $p < .001$, 95% CI = [.27, .73]. Overall, generating creative ideas triggered a focus on the self, which, in turn, boosted perceived self-disclosure.

Discussion

The results of experiments 1-3 demonstrate the creative self-disclosure effect is robust and replicable across two different brainstorming topics and different participant samples. The results of experiment 3 also shed light on the underlying psychological mechanism—perceived self-disclosure is partially mediated by self-focus during the process of generating creative ideas. Because creative ideas derived from self-focused attention are uniquely personal, the act of sharing a creative idea is perceived to be revealing of the self. In the next study, we sought to investigate a potential boundary condition of the creative self-disclosure effect—the ambiguity and structure of the problem space.

A problem space can be highly structured and well defined, or it can be relatively broad and ambiguous (Voss & Post, 1988; Vartanian, 2009). For instance, one might ask problem solvers to generate ideas for new candle scents without indicating what kind of scent or scents upon which to focus, thus leaving the objective open to interpretation. Conversely, one might restrict problem solvers to one particular idea category (e.g. generate new ideas for fruit scented candles), thus making the problem narrower and less ambiguous. It is possible that engaging in the creative process can feel more personally revealing when individuals have the latitude to freely decide from a wide range of possibilities which areas of the problem space are interesting and meaningful and then choose to focus more attention on that subset of the problem space (Lepisto & Pratt, 2017). A highly structured and well defined problem space might limit the ability to make personally revealing choices in the process of generating ideas—a restriction that should attenuate the creative self-disclosure effect. When a task is narrowly defined, the fact that a problem solver generates ideas within one topic domain can be externally attributed to task demand rather than to a revealing personal preference (Milgram, 1974; Moore & Gino, 2013). In contrast, when generating ideas in response to a more ambiguous and unstructured problem, the decision to focus disproportionate attention within one topic domain may reflect a choice that might reveal one's own personal interests and preferences and hence may feel more self-disclosing (Lepisto & Pratt, 2017).

The forgoing logic leads to two predictions. First, we expect that the creative self-disclosure effect should be significantly attenuated when individuals are restricted via specific instructions to generate creative ideas within one idea category (e.g. Generate creative ideas for fruit scented candles) compared to when they are not restricted by idea category (e.g. Generate creative ideas for scented candles). Second, zeroing in on and becoming relatively more

absorbed with one particular idea category while working on a less restricted problem should produce greater feelings of self-disclosure. The decision to focus disproportionate attention on one or a few idea categories as opposed to other possibilities is potentially revealing of the self because the decision to focus and where may disclose one's own unique preferences. We test these hypotheses in experiment 4.

Experiment 4

Participants and procedure. We recruited 402 participants through Amazon Mechanical Turk. Of those 402 participants recruited initially, three were excluded for entering all blanks instead of ideas, leaving a final participant count of 399 (49% male, M_{age} = 36) who were randomly assigned to one of four conditions in a 2 (Instructions: creative vs uncreative) x 2 (Topic: category restricted vs unrestricted) between subjects design. Within the category unrestricted conditions, the creative and uncreative prompts were identical to experiment 1. The wording in parentheses varied by condition (creative vs uncreative): "This next section is a task about product development. We are looking for some ideas for (new/word omitted) types of scented candles that are (creative, novel, and unique/ generic, conventional, and typical). We want these scents to be as (creative, novel, and unique/ generic, conventional, and typical) as possible. Please take the next five minutes to write as many (creative, novel, and unique/generic, conventional, and typical) ideas as possible for (new/word omitted) candle scents."

Within the category restricted conditions, the prompt was altered so that participants were requested to only focus on candle scent ideas that were fruit scented. Thus, participants in the category restricted conditions read the following prompt with the wording in parentheses varied by condition (creative vs uncreative): "This next section is a task about product development. We are looking for some ideas for (new/word omitted) types of fruit scented candles that are

(creative, novel, and unique/ generic, conventional, and typical). We want these fruit scents to be as (creative, novel, and unique/ generic, conventional, and typical) as possible. Please take the next five minutes to write as many (creative, novel, and unique/generic, conventional, and typical) ideas as possible for (new/word omitted) fruit candle scents."

Measures

Perceived self-disclosure: Participants responded to the same self-disclosure scale used in experiments 1-2. The perceived self-disclosure scale was once again reliable ($\alpha = .94$), so the items were averaged together.

Within-category fluency: In order to test our hypothesis that greater focus in the unrestricted condition should be correlated with greater perceived self-disclosure, we asked to coders to independently categorize all of the ideas in the unrestricted category condition (1,400 ideas total) based on how similar the ideas were to each other. Following procedures used in prior research (e.g. Nijstad, Stroebe, & Lodewijkx, (2002), the ideas were sorted into categories of similar types of candle scent ideas (e.g. all laundry related scents into one category, all wood related scents into another category and so forth). Once the ideas were sorted into categories, we then divided the total number of ideas by the total number of categories covered by each participant to reach a final score of within-category fluency. Higher scores indicate greater focus—more ideas generated within fewer categories.

Results

An ANOVA revealed a significant main effect of creativity condition on self-disclosure such that participants in the creativity condition reported significantly more self-disclosure ($M = 4.65$, $SD = 1.45$) than did participants in the uncreative condition ($M = 3.61$, $SD = 1.65$), $F(3,$

396) = 44.5, $p < .001$, 95% CI = [.36, .67]. There was also a significant main effect of category restriction such that participants in the unrestricted category condition reported higher self-disclosure (M = 4.32, SD = 1.69), than did participants in the restricted condition (M = 3.95, SD = 1.57), F (3, 396) = 5.09, p = .024, 95% CI = [.02, .33]. Finally, as predicted, there was a significant interaction between the creativity and category restriction conditions F(3, 396) = 4.50, p = .031, 95% CI = [.01, .32].

We conducted planned contrasts to reveal the form of the interaction (See Figure 1). First, replicating the results of experiments 1-3, the results showed that, within the category unrestricted condition, participants reported higher self-disclosure when generating creative ideas (M = 4.99, SD = 1.36) compared to participants generating uncreative ideas (M = 3.63, SD = 1.72) F(1, 398) = 37.07, $p < .001$, 95% CI = [.46, .90]. Second, as predicted, the creative self-disclosure effect emerged more strongly when participants were asked to generate creative ideas that were unrestricted by category (M = 4.99, SD = 1.36) than when they were asked to generate creative ideas that were restricted by category (M = 4.31, SD = 1.46), F(1, 398) = 8.93, $p < .001$, 95% CI = [.12, .57]. Finally, within the uncreative conditions, the results showed that simply allowing participants to generate ideas that were unrestricted by category (M = 3.63, SD = 1.72) did not produce higher perceived self-disclosure than participants who generated uncreative ideas that were restricted by category (M = 3.61; SD = 1.60), F(1, 398) = .05, p = .94, 95% CI = [-.25, .20].

INSERT FIGURE ONE HERE

We also predicted that focusing on and becoming relatively more absorbed with one particular idea category while working on a less restricted problem should produce greater feelings of self-disclosure. In support of this prediction, among participants assigned to the

unrestricted condition, within-category fluency was positively correlated with perceived self-disclosure, R = .23, p = .023. In contrast, neither the sheer number of ideas generated, R = - .005, p = .91, nor the sheer number of categories covered, R = .07, p = .49, were correlated with perceived self-disclosure.

Discussion

Replicating and building on the results of experiments 1-3, we again confirmed our prediction that creative ideation feels self-disclosing and we also identified the structure and ambiguity of the problem space as a boundary condition that attenuates this effect. Interestingly, we also found that within the unrestricted category condition, the more narrowly focused the ideas were (within category fluency), the more self-disclosing the ideas were perceived to be. In other words, it was not enough to merely share a lot of ideas to produce feelings of self-disclosure, nor was it sufficient to generate ideas across a wide range of categories. Rather, perceived self-disclosure was higher among participants who generate a larger number of ideas within fewer idea categories. This result seems consistent with a growing stream of research suggesting that creativity not only demands cognitive flexibility but also focused persistence (Nijstad, De Dreu, Rietzschel & Bass, 2010). Our results suggest that focused persistence in the creative process might feel personally revealing because it reflects an idiosyncratic decision to pursue one subset of ideas from among a number of available options.

One limitation that might be addressed in future research is that we restricted participants to a relatively common category (fruit scented candles) that might, in and of itself, be somewhat uncreative. Would this pattern of results have emerged if we had restricted participants to a more inherently revealing category such as, “scents that remind you of your childhood” or would the

fact that participants are instructed to focus on one category reduce the autonomy and choice that might be necessary for the creative self-disclosure effect to emerge?

One important limitation of experiments 1-4 is that we asked people to report their perceptions of self-disclosure without interacting with a partner. Testing our hypothesis in the context of a face-to-face interaction is crucial for several reasons. First, we want to demonstrate the robustness of creative self-disclosure in the context of a social interaction given that in the real world, ideas are often shared in collaboration with others (Paulus & Yang, 2000). Second, a dyad study will allow us to extend our focus from perceptions of self-disclosure (did I share something revealing?) to partner self-disclosure (did my partner share something revealing with me?).

Finally, we consider an important implication of creative self-disclosure—revealing and listening to creative ideas might impact how partners view each other in two ways. First, creative self-disclosure might boost liking between partners because there is evidence that we both like others who disclose to us and we also like people as a result of disclosing to them (Collins & Miller, 1994). If creative collaboration provides the opportunity for self-disclosure, then hearing and sharing creative ideas should cause partners to like each other more. Second, if self-disclosure is taking place during creative collaboration then sharing personal information might allow partners to form judgments about their partner's personality traits and be more confident, based on that information, that their judgments about their partner are accurate (Swann & Gill, 1997). In other words, hearing a partner's creative ideas, if they are personally disclosing, should make us feel that we know our partner better. Consequently, in the next study, we test our hypothesis that sharing creative ideas with a partner should elicit mutual perceived disclosure

and disclosure should, in turn, boost liking between partners and raise the confidence with which partners' hold judgments about each-other.

Experiment 5

Participants. We recruited 334 undergraduates (59% female, M_{age} = 20) to participate in the experiment from a departmental subject pool. Students were compensated with extra credit in exchange for their participation. Eight participants were excluded for failing to follow instructions, thus rendering their data uninterpretable. After these exclusions, a total of 326 participants remained, divided into 163 pairs. Eighty-three pairs were randomly assigned to the uncreative condition and 80 pairs were assigned to the creative condition.

Procedure. Upon entering the lab, all participants were asked to complete an idea generation task that was identical to the one used in experiments 2 and 3. Once seated at a computer, participants read the following prompt with the wording in parentheses varied by condition (creative vs uncreative): "This next section is a task about product development. We are looking for some ideas for (new/word omitted) types of scented candles that are (creative, novel, and unique/ generic, conventional, and typical). We want these scents to be as (creative, novel, and unique/ generic, conventional, and typical) as possible. Please take the next five minutes to write as many (creative, novel, and unique/generic, conventional, and typical) ideas as possible for (new/word omitted) candle scents." Participants then shared their ideas with each other by reading their ideas aloud. After sharing all of their ideas with each-other, partners were asked to reveal which of their own ideas they thought were most creative or uncreative, depending on the

condition to which they were randomly assigned. Upon completing this discussion, participants were then asked to complete a survey on their own.

Measures

Perceived self-disclosure. We used the same four-item self-report measure of self-disclosure used in experiments 1-3. The items were as follows: “My ideas revealed something about my personality,” “My ideas demonstrated something about me,” “My ideas indicated some of what I am like as a person,” and “My ideas did not reveal anything about me (reverse scored).” The scale was highly reliable ($\alpha = .90$), so the items were averaged together.

Perceived partner self-disclosure. Participants then responded to a similar scale about their partners, also rated on a seven-point Likert scale from 1, strongly disagree, to 7, strongly agree. The items were as follows: “My partner's ideas revealed something about their personality,” “My partner's ideas demonstrated something about them,” “My partner's ideas indicated some of what they are like as a person,” and “My partner's ideas did not reveal anything about them.” The scale was highly reliable ($\alpha = .91$), so the items were averaged together.

Liking. Participants then responded to a similar scale about how much they liked their partner, also rated on a seven-point Likert from strongly disagree to strongly agree. The items for that were: “I would work with this person again if given the chance,” “I enjoyed participating with this person,” “In general, I like the person I was paired with,” and “I would not want to interact with this person again.” The scale was highly reliable, ($\alpha = .89$), so the items were averaged together.

Confidence in the accuracy of partner judgments. Participants were then asked to rate their partner on a series of 10 Barnum statements (Forer, 1949), such as “Most of the time they are

positive and cheerful, but there has been a time in the past when they were very upset," or "They are a very kind and considerate person, but when somebody does something to break their trust, they feel deep-seated anger." The items were each rated on a five-point scale asking how accurately the statements described their partner from "not accurately at all" to "extremely accurately." We had no hypothesis about the content of the judgments themselves, so we did not analyze those data. Rather, we were interested in the confidence with which they held these judgments. Therefore, after completing each statement participants responded to the question "How confident are you in the answer above on a scale of 1 (not at all confident) to 100 (extremely confident)?" The 10 items measuring confidence were reliable ($\alpha = .96$), so the confidence ratings for each of the 10 statements were averaged together.

Results

Across all of our hypothesis tests, the unit of analysis was the dyad, so the scores of both partners were averaged together to create a dyadic score. Replicating the results of experiments 1-3, dyads in the creative condition reporting significantly higher self-disclosure ($M = 5.16$, $SD = .79$) than did dyads in the uncreative condition, ($M = 4.58$, $SD = 1.01$), $F(1, 162) = 16.72$, $p < .001$, 95% CI = [.15, .43]. Second, as hypothesized, dyads reported their partner self-disclosed significantly more in the creative ($M = 5.11$, $SD = .70$) compared to the uncreative condition ($M = 4.69$, $SD = 1.06$), $F(1, 162) = 8.83$, $p = .0037$, 95% CI = [.07, .35]. Third, contrary to our prediction, dyads in the creative condition did not report liking their partner significantly more ($M = 5.66$, $SD = .74$), compared to dyads in the uncreative condition ($M = 5.48$, $SD = .82$), $p = .14$, $F(1, 162) = 2.107$, 95% CI = [-.03, .21]. This null result could be due to a ceiling effect on the liking measure as the mean reported liking across conditions was relatively high and the standard deviation was somewhat low ($M = 5.57$, $SD = .78$). We speculate further in the

discussion section. Finally, turning to the measures of perceived confidence, an ANOVA revealed dyads in the creative condition felt significantly more confident in the personality judgments they made about their partner (M = 53.7, SD = 19.0) compared to dyads in the uncreative condition, (M = 43.4, SD = 19.0), $F(1, 146)^1 = 10.14$, p = .0018, 95% CI = [1.95, 8.35].

We conducted a mediation analysis using the bootstrap method with 5000 samples to test the hypothesis that confidence in personality judgment about one's partner is mediated by the extent to which an individual perceived that their partner self-disclosed (Mediation Package in R, Tingley, Yamamoto, Hirose, Keele, and Imai 2013). Group condition (creative: 1 or uncreative: -1) was the independent variable in the model, while confidence in the accuracy of judgments made about the partner was the dependent variable. Ratings of dyads perceived partner self-disclosure was the mediating variable. Results showed a significant mediated effect = 1.50, p = .001, 95% CI = [.48, 2.88]. Once partner self-disclosure was controlled for in the model, there was still a significant direct effect = 3.68, p = .024, 95% CI = [.50, 6.76]. This mediation is only partial (proportion mediated = .28, p < .01, 95% CI = [.09, .75]. Overall, sharing creative ideas triggered the perception that one's partner self-disclosed which, in turn, boosted the confidence with which partners held personality judgments about each other.

Discussion

Experiment 5 demonstrated the creative self-disclosure effect emerges even in the context of a face-to-face interaction in which ideas were actually shared. Moreover, the results showed that individuals not only believed they disclosed personal information after sharing creative ideas, they also felt that their partner also revealed personal information. An important implication of these results is that creative self-disclosure should also shape our perceptions of

the individual with whom we are collaborating. Indeed, the results also show that self-disclosure also boosted confidence in the accuracy of judgments that partners made about each-other's personality. In other words, because creative ideas are personal revealing, they become a basis upon which to make judgments about our interaction partners, making them seem more known to us.

We also expected that sharing creative ideas should boost liking since mutual self-disclosure can foster social bonds (Rook, 1984; Collins & Miller, 1994). This null result might be due to a ceiling effect, given overall liking was high across conditions. Alternatively, it is possible that, though creative expression is self-disclosing, the information shared might not inevitably lead to positive impressions (Staw, 1995). Sharing creative ideas can cue a range of perceptions that can be positive or negative depending on the context. For example, in an educational setting, teachers like less creative students more than highly creative students (Westby & Dawson, 1995). When evaluating leadership potential, creative people are viewed as too risky and unpredictable to be effective leaders (Mueller, Goncalo & Kamdar, 2011). These contradictory impressions of creative people suggest opportunities for future research on potential moderators of a link between creative self-disclosure and liking (Collins & Miller, 1994). For example, creative self-disclosure might vary on appropriateness—ideas that are overly revealing might diminish liking (Derlega and Grzelak, 1979).

Consider a few ideas from one participant's list of candle scent ideas who was assigned to the creativity condition, "Tears of the Dead, Vanquished Foes, Guile Guilt and Gore, Dog Farts, Zombie Outbreak, Burning Cookies, Spoiled Milk in a Hot Car, etc." A partner who hears these ideas might feel they are personal revealing, but the impression might not necessarily be positive. On the other hand, ideas like these are so distinctive that, if one finds a partner who

appreciates them, then liking should increase considerably. In most social contexts, ideas like these might be withheld to avoid making a negative impression but in the context of brainstorming, these filters are intentionally removed, making it more difficult to engage in impression management and be creative at the same time. Future research on the interpersonal consequences of creativity can test these possibilities by varying norms around whether creativity is viewed as desirable or appropriate, how much creativity is too much or too soon and whether a creative act is viewed as spontaneous or highly controlled by situational cues (Collins & Miller, 1994).

General Discussion

Existing research on creative idea generation has been focused almost exclusively on the question of how to encourage people to express a wide range of creative ideas. Given creative ideas are highly prized across so many contexts, the antecedents of creativity are clearly important. However, the present studies suggest that the act of sharing a creative idea may also have considerable personal and interpersonal consequences. The creative process involves idea expression, but our findings suggest it is not merely ideas that are being shared as people may also feel personal information has spilled out in the process. When prompted to be creative, individuals are not just responding in the abstract; rather they are reaching into themselves to share ideas that reflect their unique point of view, an act that feels self-disclosing.

Finally, we found that people use creative ideas to make personality judgments about their partners and these judgments are held more confidently. Sharing creative ideas prompted the mutual perception of self-disclosure (I disclosed to my partner and my partner disclosed to me) and that exchange made people feel they knew their partner better. People were more confident in the judgments they made about their partner but did not necessarily like them better,

highlighting why the creative act is so risky. Ideas can convey personal information that can be used to form judgments that can be either positive or negative. This pattern of results is consistent with prior research on self-disclosure showing that a single act of self-disclosure does tends to elicit self-disclosure from one's partner. In other words, there may not have been a merely subjective sense that one's partner had disclosed more in the process of being creative, but it also appears people are recognizing and possibly responding to the greater disclosure of their partner—a process that could lead to escalating self-disclosure over time (Collins & Miller, 1994).

Implications and Future Directions

Our findings suggest numerous opportunities for future research that could proceed in several directions.

Downstream Consequences of Creative Self-Disclosure

Given that self-disclosure has so many downstream consequences for interpersonal relationships including, intimacy (Laurenceau, Barrett & Pietromonaco, 1998), liking (Collins & Miller, 1994), loneliness (Wei, Russell & Zakalik, 2005), interdependence (Rusbult & Van Lange, 2003) and so on, the implications for potential consequences of creativity are considerable. Rather than viewing creative ideation from the narrow lens of boosting creative output, we can begin to explore the role of creative collaboration in fostering social bonds. In thinking about the potential interpersonal consequences of idea sharing, however, caution flags should be raised around the assumption that the consequences will necessarily be positive. Indeed, sharing creative ideas makes an individual vulnerable and that vulnerability can either be

an opportunity for bonding and subsequent relationship building or an interpersonal risk that might have negative repercussions.

Potential moderators of the creative self-disclosure effect

We decided to stick with one topic across studies to provide multiple direct and indirect replications of the creative self-disclosure effect. We also picked candle scents and potato chips to provide a somewhat conservative test of our hypothesis—these products are extremely common and not inherently highly revealing of the self. However, future research should investigate whether this effect occurs in a wider range of tasks and whether the effect is moderated by task type. For instance, tasks that allow for autonomy, agency or choice might all give people that latitude to make decisions that might be personally revealing. Prior research has shown that individuals may choose to self-disclose directly, but our results suggests that disclosure may occur indirectly as people work on tasks that allow for personally revealing choices.

Although our focus in this paper was on the effect of engaging in creative ideation, future research might also look at the possible role of trait creativity in moderating creative self-disclosure. Highly creative personalities are notoriously self-focused, to the point of being described as highly competitive, individualistic, self-aggrandizing and self-absorbed (Gough, 1979). It is possible that highly creative people are generally more willing to self-disclose in social situations, perhaps even when it is not necessarily appropriate or advantageous to do so, perhaps contributing to the perception that creative people are quirky and unpredictable (Mueller, Goncalo & Kamdar, 2011).

Relatedly, perceived self-disclosure might be moderated by the extent to which creativity is a core element of one's personal identity. For example, Janssen's (2003) work on job involvement and innovative behavior shows that highly involved employees are more likely to react negatively and engage in conflict with co-workers who resist their ideas, because being innovative is part of their self-concept. In the context of the current results, this raises the possibility that the self-disclosure effect found here should be particularly strong for people whose self-concept is strongly tied to creativity because they take their own work much more personally (Vincent & Kouchaki, 2016).

Finally, future research should investigate the possibility that the mere instruction to be "creative" could also act as a prime that might trigger a host of associations that could prompt feelings of self-disclosure without actually generating creative ideas. For instance, previous work has shown that the concept of creativity can indeed be primed (Gino and Ariely, 2012) and that priming the concept of creativity produces a mindset that carries over to subsequent, unrelated, tasks (Vincent and Kouchaki, 2016). Moreover, simply invoking the word "creative" could trigger associations like "standing out" and being "unique and different"—associations that might produce feelings of self-disclosure even in the absence of actual creative ideation (Sassenburg & Moskowitz, 2005). However, our results suggest invoking the word "creative" alone might not be sufficient, given the results of study 4 showing that instructions to be creative did not trigger perceived self-disclosure when participants were restricted to only one idea category. In other words, actually engaging in the task and generating creative ideas might be necessary as opposed to a simple instructional prime.

An Alternative Interpretation of Evaluation Apprehension

One of the biggest barriers to creative expression is evaluation apprehension—individuals withhold creative ideas to avoid rejection. Why do people take rejection so personally? Our results may offer an alternative explanation for evaluation apprehension. It might not result from the rejection of the idea per-se, but from the implied rejection of one's self. If in the process of being creative, people rely heavily on their own idiosyncratic experiences and perspectives then ideas are not merely abstract suggestions but deeply personal self-disclosures. This interpretation might explain why, for example, anonymity has been shown to liberate both creative expression and self-disclosure by reducing public self-awareness (Joinson, 2001). Similarly, prior research has shown that people generate more creative solutions when they are asked to generate ideas for other people compared to when they generate ideas for themselves (Polman & Emich, 2011). Ideas generated for one's self are directly revealing of one's personal preferences and to the extent that people might be uncomfortable disclosing information about themselves, they might be reluctant to propose solutions that might reveal too much. In contrast, ideas generated for other people might reflect what an individual thinks the other person might find appealing, thus offering cover to suggest unusual ideas without the risk of self-disclosure. The self-disclosing nature of creative work could contribute to lower psychological safety during collaborative creativity which could, in turn, make people reluctant to risk sharing valuable ideas and perspectives (Carmeli, Reiter-Palmon & Ziv, 2010; Kessel, Kratzer & Schultz, 2012).

Conclusion

Our research has shown that the creative act feels self-disclosing. Creative self-disclosure can also lead partners to form judgments about each-other and to be more confident in those judgments. Future research in this vein thus has the potential to investigate how decisions about whether to disclose, to whom and how much might also impact the ideas we choose to share or

withhold from others. Given that self-disclosure is central to the formation and quality of personal relationships, the present work suggests the many discoveries that await as we integrate creativity with the literatures on person perception, social cognition, and human bonding.

Figure 1

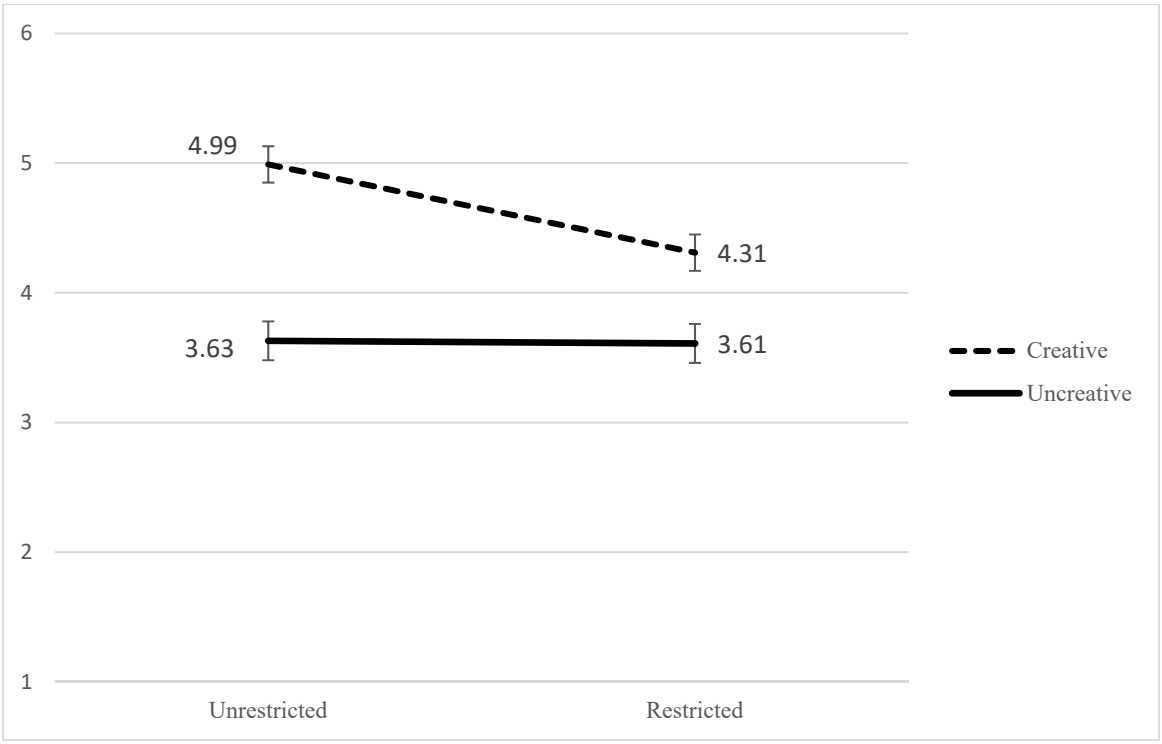

Figure 1: Mean self-disclosure by creativity and category restriction conditions (Experiment 4)

Endnotes

[1] Consistent with IRB policies, we did not force respondents to answer each question. The lower degrees of freedom in this analysis resulted from participants who chose not to respond to certain questions.

Appendix

Materials and data are available at:

https://osf.io/2hzjm/?view_only=d8619134af4645478dec1b1ffc831d9f

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