

The Liberating Consequences of Creative Work:
How a Creative Outlet Lifts the Physical Burden of Secrecy

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Abstract

A newly emerging stream of research suggests creativity can be fruitfully explored, not as an outcome variable, but as a contributor to the general cognitive and behavioral responding of the individual. In this paper, we extend this nascent area of research on the consequences of creativity by showing that working on a creative task can contribute to feelings of liberation—feelings that can help people to overcome psychological burdens. We illustrate the liberating effects of creativity by integrating the embodied cognition literature with recent research showing that keeping a secret is experienced as a psychological and physical burden. While secrecy is metaphorically related to physical burden, creativity is metaphorically associated with freedom to “think outside the box” and explore beyond normal constraints. Thus, we predict permission to be creative may actually feel liberating and feelings of liberation may, in turn, lift the physical burden of keeping a big secret. The results of three studies supported our prediction and suggest that the opportunity to be creative may be a way for people to unburden without directly revealing secrets that could cause shame and embarrassment. We discuss the implications of our results for future research on the psychological consequences of performing creative work.

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“Having a creative outlet is really the best thing that you can do for yourself.”

Eddie Brickell, singer-songwriter

Creative ideas are highly desirable because they have the potential to fuel scientific progress, spark social change, and even generate profit (Runco, 2004; George, 2007; Hennessey & Amabile, 2010). Given the presumed value of creative solutions, it is not surprising that research on the conditions that foster creative output continues to grow (Hennessey & Amabile, 2010). Yet, in contrast to the long stream of research on the conditions that foster creativity, much less attention has been paid to the question of whether creativity might have downstream consequences. Ironically, the sparse research that does exist has focused mainly on the downside consequences of being creative. For example, individuals who share a creative idea at work risk being pegged as quirky, unpredictable and unfit for leadership positions (Mueller, Goncalo, & Kamdar, 2011). And, people who view themselves as highly creative may be prone to feelings of entitlement that license the commission of dishonest acts (Vincent, 2013). Indeed, merely priming the concept of creativity can trigger dishonesty (Gino & Ariely, 2012). The consequences of creativity are not necessarily negative, however. Other research has shown that priming creativity can help people overcome the tendency to inadvertently plagiarize existing ideas by making salient examples less accessible during idea generation (Sassenberg, Kessler & Mumme, 2007). By reducing the automatic activation of associations, creativity priming can also prevent the triggering of negative stereotypes (Sassenberg & Moskowitz, 2005).

The promise of this newly emerging stream of research is that it suggests creativity can be fruitfully explored, not as an outcome variable, but as a contributor to the general cognitive

and behavioral responding of the individual. In this paper, we extend this nascent area of research on the consequences of creativity by showing that working on a creative task can contribute to feelings of liberation—feelings that can help people to overcome psychological burdens. We illustrate the liberating effects of creativity by integrating work on the embodiment of creativity with recent research showing that keeping a secret is experienced as a psychological and physical burden.

Unburdening: The liberating experience of creative work

The distinguishing characteristic of a creative idea over an idea that is merely practical is that creative ideas diverge from existing solutions in a novel direction (Amabile, Barsade, Mueller & Staw, 2005). Hence, the act of being creative is metaphorically associated with freedom to “think outside the box” and explore beyond normal constraints (Leung et al., 2012). Enacting metaphors for creativity like “think outside the box” have been shown to actually boost creative problem solving, suggesting a mind-body linkage between creativity and feeling liberated as opposed to confined (Leung et al., 2012). For example, problem solvers who were seated inside of a box were less creative than those seated outside of a box, even if the box was merely a shape taped to the floor (Leung et al., 2012). Research linking creativity to dishonesty also supports this metaphorical link between creativity and freedom to test the boundaries of convention. Creativity, through its association with rule-breaking can help individuals to lift the constraints on generating unconventional ideas while, unfortunately, also lifting the constraints on being truthful (Gino & Ariely, 2012; Gino & Wiltermuth, 2014). This metaphorical association between creativity and liberation from constraint may be bi-directional. In other words, if embodying liberation versus constraint impacts creative problem solving (Leung et al., 2012), then performing a creative task may also feel liberating.

The burden of keeping a secret is one type of psychological burden that might illustrate the potentially liberating consequences of doing creative work. Many people keep secrets at the expense of their health and well-being (Kelly, 2002; Pennebaker, 1989). Keeping a secret, particularly a big secret, can cause stress and deplete cognitive resources (Lane & Wegner, 1995; Critcher & Ferguson, 2014). Recent research has drawn on the embodied cognition perspective to argue that secrets are also physically burdensome (Slepian, Masicampo, Toosi, & Ambady, 2012). According to this perspective, abstract concepts can become intertwined with physical experiences and eventually attain a reality of their own (Barsalou, 2008). For example, people rate a stranger's personality as warmer when holding a warm as opposed to a cold beverage (Williams & Bargh, 2008). Because secrets are metaphorically understood as physical burdens (e.g. carrying a secret weighs you down), people can actually experience the physical sensation of being "weighted down" when keeping a secret (Slepian et al., 2012). When people feel physically burdened, physical tasks are judged to require more effort (Proffitt, 2006). Hence, several studies have shown that people who keep a secret estimate that hills will be steeper and distances will be farther (Slepian et al., 2012). They are also less likely to help people with tasks, like carrying books, that require physical effort (Slepian et al., 2012).

Secrets vary in intensity and severity. For instance, a secret about being unfaithful to a significant other is more significant than thinking about being unfaithful (Vrij, Nunkoosing, Paterson, Oosterwgel, Soukara, 2002). Compared to a smaller secret, maintaining a big secret has more serious physical, psychological, and emotional costs. For instance, individuals keeping a big secret report significantly lower self-esteem, satisfaction with life, physical well-being, social wellbeing, and emotional well-being (Vrij et al., 2002). In a more recent study, participants who were instructed to think about a big secret reported feeling greater physical burden and reported

that physical tasks would require more effort and energy than participants who were instructed to think about non-significant, small secrets (Slepian et al., 2012). The burden of secrecy can be lifted by directly revealing the secret (Slepian, Masicampo, & Ambady, 2014). For example, thinking about a secret makes a hill appear steeper, but revealing a secret eliminates the effect (Slepian et al., 2014). Yet, there are many circumstances in which revealing a secret might have significant negative consequences. Indeed, the most common secrets are harbored to avoid shame or embarrassment (Maas, Wismeijer, van Assen, & Aquarius, 2012). Thus, revealing a secret, though unburdening, may cause harm.

We argue that the burden of keeping a big secret may also be mitigated by giving individuals the opportunity to work on a creative task, even if that task does not afford the opportunity to confess. People who keep a big secret may be forced to actively suppress thoughts that are unwelcomed and intrusive (Slepian et al., 2014). In other words, keeping a big secret constrains people to a ruminative focus on suppressing unwanted thoughts (Gold & Wegener, 1995). Instructions to be creative, by priming the expectation to “think different” helps individuals to break away from the constraining effects of existing knowledge to generate a wider range of ideas (Sassenberg et al., 2007). Less creative thinkers tend to focus their thoughts narrowly around one theme or category—generating many ideas that are highly similar to each-other—while more creative thinkers feel free to jump around between categories—generating many ideas that are distinct from each-other (Brown & Paulus, 2002; Goncalo & Staw, 2006). Being creative might relieve the burden of secrecy by permitting uninhibited exploration—roaming freely across the boundaries between different types of ideas rather than being constrained to consider a narrow set of ideas within only one category or theme—a process that is likely to feel liberating. Thus, we expect that the opportunity to be creative will trigger

feelings of liberation which will, in turn, lift the physical burden of keeping a big secret. That is, we expect to replicate previous findings demonstrating the physical burden of keeping a big secret across our control conditions—an effect that should be eliminated when individuals are permitted to be creative.

Overview of current research

We test these predictions in three studies in which we ask participants to recall either a small or big secret and then give them the opportunity to generate ideas before engaging in a task that measures a sense of physical burden. In studies 1 and 2, we manipulate task objectives by asking participants to generate ideas that are either creative or practical depending on the condition to which they were randomly assigned. We theorized that the unburdening effect of being creative should be strongest when individuals are allowed to generate ideas without restrictions. Consequently, in study 3, we varied task objectives such that participants were asked to either restrict their idea generation to only one general category of ideas or to generate ideas without any restrictions. Across all three studies, we measure feelings of liberation directly to trace the underlying psychological process through which creativity lifts the burden of secrecy.

Study 1

Method

Participants and design

107 participants from a large U.S. university (39% male; $M_{age} = 19.5$ years) participated for course credit. Our sample size was the entire course, and we stopped data collection once everyone in the course had been given the opportunity to participate. Participants were told that they would be taking part in a study regarding the psychology of secrets. Participants were

randomly assigned to one of four conditions. The experiment was a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) factorial design.

Procedure

Participants entered the laboratory and were led to individual cubicles. Participants first completed a task designed to manipulate the type of secret they recalled (Slepian et al., 2012). Participants were randomly assigned to recall either a big personal secret or a small personal secret. We expect big secrets to be more burdensome than small secret but that this burden is lifted in the creativity condition. They were instructed, “Without revealing specific details about your secret, we are curious what it pertains to. Please write about your (*big/small*) secret in the provided box.”

Following this task, participants completed an idea generation task. Participants were randomly assigned to receive instructions to generate solutions to a problem that were either creative or practical by substituting the appropriate word (in parentheses) in the following communication to participants:

“A restaurant near campus has recently gone bankrupt, and there is now an empty space where the restaurant used to be. Please generate as many (*creative/practical*) ideas for new businesses that might go into that space as you can in 10 minutes.”

After generating ideas, participants engaged in a task that measures physical burden. Following the procedure outlined in Slepian et al. (2012; Study 2), participants tossed a beanbag at a target 265 centimeters away (Balci et al., 2010; Rieser, Pick, Ashmead, & Garing, 1995). The dependent measure was the distance thrown in centimeters, with distances underthrown recorded as negative values, accurate tosses as zero, and distances overthrown as positive values. The burden of holding a big secret causes a given distance to appear farther

(Slepian et al., 2012), so participants who feel burdened by their secret should overestimate distance, thereby causing people to overthrow when tossing the beanbag at a target.

Following the physical burden measure, participants returned to their cubicle to complete a survey which included a three item measure of feelings of liberation during the idea generation task. The items were on a seven point scale ranging from “Strongly disagree” to “Strongly Agree.” The three items were, (1) “During the idea generation task, I felt constrained” (reverse coded), (2) “During the idea generation task, I felt liberated,” and (3) “During the idea generation task, I felt uninhibited” ($\alpha=.68$). Following the completion of the study, participants were probed for suspicion regarding the study’s purpose and debriefed. No participant correctly identified the true purpose of the study.

Results

The results of a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) ANOVA on distance thrown revealed no significant main effect of secrecy, $F(1, 103) = .27, p= 0.61, \eta^2=.003$, but a significant main effect of the idea generation task, $F(1, 103) = 10.36, p=0.002, \eta^2=0.09$, and a significant interaction, $F(1, 103) = 7.99, p=0.006, \eta^2=0.07$. Figure 1b depicts this interaction. Planned contrasts revealed that in the big secret condition, engaging in a creative idea generation task ($M=3.98\text{cm}, SD=4.20\text{cm}$) significantly reduced the distance overthrown in comparison to the practical idea generation task ($M=30.04\text{cm}, SD=4.44\text{cm}$), $F(1, 103) = 18.19, p<0.001, \eta^2=0.15$. In contrast, in the small secret condition, there was no significant difference between the creative idea generation task ($M=13.95\text{cm}, SD=18.18\text{cm}$) and the practical idea generation task ($M=15.63\text{cm}, SD=25.84\text{cm}$), $F(1, 103) = 0.08, p= 0.78, \eta^2=0.001$.

Insert Figure 1a about here.

Insert Figure 1b about here.

We hypothesized that the unburdening effect of the creative task in the big secret condition would be mediated by feelings of liberation (see Figure 1a for the theoretical model). Therefore, we tested for mediated moderation by running the multiple regression and bootstrapping procedure on PROCESS in SPSS as recommended by Hayes (2013). We used Model 59, which tests whether the significance of the secret (big/small) moderates the path from type of idea generation task (practical vs. creative) to feeling liberated and the path from feeling liberated to distance thrown. Furthermore, it tests whether the interaction between the significance of the secret and the idea generation task on distance thrown, is no longer significant, which would indicate full mediation. We coded the secrecy variable as follows: small secret = 0; big secret = 1, and the idea generation variable as follows: practical = 0; creative = 1.

Table 1a presents the results for the two multiple regressions.

Insert Table 1a about here.

The first regression was of the mediator variable (feeling liberated) on significance of secret and type of idea generation task. The results demonstrated that the interaction between type of idea generation task and significance of secret had a significant, positive effect on feeling liberated. In particular, in the big secret condition, participants felt significantly more liberated when they engaged in a creative ($M=4.94$, $SD=0.17$) than in a practical ($M=2.89$, $SD=0.18$) idea generation task, $F(1, 103) = 67.92$, $p < .001$, $\eta^2 = 0.40$. In comparison, in the small secret condition, there was no statistically significant difference between the creative ($M=4.32$, $SD=0.83$) and

practical ($M=3.88$, $SD=1.13$) idea generation tasks, $F(1, 103) = 3.19$, $p=0.08$. The second regression was of the outcome variable (distance thrown) on the independent, mediator, and moderator variables. The results of this second regression demonstrated that, first, the interaction between the significance of the secret and the idea generation task is no longer significant, indicating full mediation, and that, second, the interaction between feeling liberated and the significance of the secret had a significant, negative effect on the distance thrown (i.e. the more liberated the participants felt the less they overthrew the bean bag in the big secret condition). The bootstrap procedure revealed a significant indirect effect of the type of idea generation task on distance thrown via feeling liberated in the big secret, but not in the small secret condition. These bootstrapping results can be found in Table 1b.

Insert Table 1b about here.

We also measured affect and found no evidence that the opportunity to be creative impacted positive or negative affect (see the supplementary section for detailed analyses) in this study or in any of our subsequent studies.

Study 2

The results of study 1 showed that the physical burden of keeping a big secret was reduced when people were given the opportunity to work on a creative task. Consistent with other research suggesting that creativity is metaphorically related to liberation from constraint, we also found that the unburdening effect of creative work was mediated by feelings of liberation. In order to demonstrate the robustness of our findings and their generalizability to other tasks, we conducted a second study with a different dependent measure of physical burden. In Study 2, we examined whether people burdened by a secret would be less willing to help

others with physical tasks and whether working on a creative task would reduce the burden and increase individuals' willingness to help others. See Figure 2a for the theoretical model.

Insert Figure 2a about here.

Method

Participants and design

150 participants from a large U.S. university (55% male; $M_{age} = 26.9$ years) participated in exchange for \$10. We recruited participants using a school-wide email newsletter; we stopped data collection once everyone had been given the opportunity to participate. Consistent with Study 1, participants were told that they would be taking part in a study regarding the psychology of secrets. Participants were randomly assigned to one of four conditions. The experiment was a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) factorial design.

Procedure

Participants arrived in the lab and completed the secret manipulation and then the idea generation task described in Study 1.

After the idea generation task, participants engaged in a physical helping task, which measures a sense of burden. For this task, participants were asked to help move stacks of books (each stack included three books of approximately the same weight) (Slepian et al., 2012; Study 4). The books were located directly next to the participant on a shelf, and the researcher explained that the lab was new and that they were in the process of moving into the new space. The number of book stacks (from zero to seven) that participants moved was recorded as the dependent variable. As physical tasks are effortful, individuals who are concealing a secret

should view the task as more burdensome and be less willing to help. Participants also completed the liberation scale from study 1 ($\alpha=.90$). During debriefing, no participant identified the purpose of the study.

Results

The results of a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) ANOVA on the number of book stacks carried revealed no significant main effect of secrecy, $F(1, 146) = 1.88, p = 0.17, \eta^2=.01$, and no significant main effect of the idea generation task, $F(1, 146) = 2.9, p=0.09, \eta^2=0.02$, but, as predicted, a significant interaction, $F(1, 146) = 5.02, p=0.03, \eta^2=0.03$ (See Figure 2b). Planned contrasts revealed that in the big secret condition, engaging in a creative idea generation task ($M=3.95, SD=0.39$) significantly increased the number of book stacks participants were willing to carry in comparison to the practical idea generation task ($M=2.4, SD=0.39$), $F(1, 146) = 7.91, p<0.006, \eta^2=0.05$. In contrast, in the small secret condition, there was no significant difference between the creative idea generation task ($M=2.53, SD=0.4$) and the practical idea generation task ($M=2.74, SD=0.39$), $F(1, 146) = 0.14, p = 0.71, \eta^2=0.001$.

Insert Figure 2b about here.

We tested our hypothesis that the unburdening effect of the creative task in the big secret condition would be mediated by feelings of liberation, using the same approach and coding we used in study 1.

Table 2 presents the results for the two multiple regressions.

Insert Table 2a about here.

The first regression was of the mediator variable (feeling liberated) on significance of secret and type of idea generation task. The results demonstrated that the interaction between type of idea generation task and significance of secret had a significant, positive effect on feeling liberated. In particular, in the big secret condition, participants felt significantly more liberated when they engaged in a creative ($M=4.61$, $SD=0.23$) compared to a practical ($M=3.17$, $SD=0.23$) idea generation task, $F(1, 146) = 20.29$, $p < .001$, $\eta^2 = 0.12$. Conversely, in the small secret condition, there was no statistically significant difference between the creative ($M=3.69$, $SD=0.23$) and practical ($M=3.67$, $SD=0.23$) idea generation tasks, $F(1, 146) = 0.01$, $p = 0.93$, $\eta^2 < 0.001$. The second regression was of the outcome variable (number of book stacks carried) on the independent, mediator, and moderator variables. The results of this second regression demonstrated that, first, the interaction between the significance of the secret and the idea generation task is no longer significant, indicating full mediation, and that, second, the interaction between feeling liberated and the significance of the secret had a significant, positive effect on the number of book stacks carried (i.e. the more liberated the participants felt the more book stacks they carried in the big secret condition). The bootstrap procedure revealed a significant indirect effect of the type of idea generation task on number of books carried via feeling liberated in the big secret, but not in the small secret condition. These bootstrapping results can be found in Table 2b.

Insert Table 2b about here.

Study 3

The results of two experiments converged on the finding that the opportunity to perform a creative task triggered feelings of liberation which, in turn, lifted the physical burden of keeping a big secret. Similar findings emerged using two different tasks that are sensitive to feelings of physical burden (throwing a bean bag and moving books). In Study 3, we again asked participants to generate ideas after recalling a secret, but we varied the extent to which the task instructions constrained participants to generate ideas in only one category or allowed participants to generate ideas that crossed multiple categories. We surmised that the liberating effect might have occurred in the creative instructions condition because instructions to be creative are metaphorically associated with freedom to explore across a wide range of different ideas (Brown & Paulus, 2002; Sassenberg et al., 2007). Thus, the freedom to diverge in many different directions versus generating ideas within only one category may be a key moderating condition that we sought to manipulate directly. We hypothesize that the expectation to stick to one category would be experienced as a constraint that would not effectively lift the burden of keeping a big secret. Figure 3a depicts the theoretical model of our predictions.

Insert Figure 3a about here.

Method

Participants and design

91 participants from a large U.S. university (47% male; $M_{age} = 19.5$ years) participated in exchange for \$15. We recruited participants from a large introductory organizational behavior course; we stopped data collection once everyone in the course had been given the opportunity to participate. Participants were randomly assigned to one of four conditions. The experiment was a 2 (Secret: big versus small) x 2 (Divergence: high versus low) factorial design. Two

participants failed to follow instructions from the researcher and proceeded to complete the debriefing before completing the dependent variable, the psychological burden task. Therefore, their data were unusable, leaving a final sample size of 89.

Procedure

Participants completed the secret manipulation described in Study 1. After completing that task, participants completed an idea generation task that is similar to the idea generation task described in Study 1. Divergence was manipulated by substituting the appropriate word (in parentheses) in the following communication to participants:

“A restaurant near campus has recently gone bankrupt, and there is now an empty space where the restaurant used to be. Please generate as many (*new uses for that space/new restaurants for that space*) as you can in 10 minutes.”

Following the idea generation activity, participants completed the physical burden task and the survey described in Study 1. The three item liberation scale was reliable ($\alpha=.82$), so the items were averaged together. During the debriefing following the study, no participant correctly identified the connections among the sections of the study.

Results

The results of a 2 (Secret: big versus small) x 2 (Divergence in idea generation task: high versus low) ANOVA on distance thrown revealed no significant main effect of secrecy, $F(1, 85) = 0.09, p = 0.77, \eta^2 = 0.001$, but a significant main effect of the idea generation task, $F(1, 85) = 6.94, p = 0.01, \eta^2 = 0.08$, and a significant interaction $F(1, 85) = 4.97, p = 0.03, \eta^2 = 0.06$ (See Figure 3b). Planned contrasts revealed that in the big secret condition, engaging in the highly divergent idea generation task ($M=2.07\text{cm}, SD=5.65\text{cm}$) significantly reduced the distance overthrown in comparison to the less divergent idea generation task ($M=29.39\text{cm}, SD=5.52\text{cm}$), $F(1, 85) =$

11.96, $p < 0.001$, $\eta^2 = 0.12$. In contrast, in the small secret condition, there was no significant difference between the highly divergent idea generation task ($M = 12.95\text{cm}$, $SD = 26.75\text{cm}$) and the less divergent idea generation task ($M = 15.23\text{cm}$, $SD = 32.31\text{cm}$), $F(1, 85) = 0.08$, $p = 0.78$, $\eta^2 = 0.001$.

Insert Figure 3b about here.

We again tested our hypothesis that the unburdening effect of the highly divergent task in the big secret condition would be mediated by feelings of liberation. Following the procedure used in the last two studies, we coded the secrecy variable as follows: small secret = 0; big secret = 1, and the idea generation variable as follows: low divergence = 0; high divergence = 1.

Table 3a presents the results for the two multiple regressions.

Insert Table 3a about here.

The first regression was of the mediator variable (feeling liberated) on type of secret and type of idea generation task. The results demonstrated that the interaction between type of idea generation task and significance of the secret had a significant, positive effect on feeling liberated. In particular, in the big secret condition, participants felt significantly more liberated when they engaged in the highly divergent idea generation task ($M = 4.7$, $SD = 1.48$) than in the less divergent idea generation task ($M = 2.7$, $SD = 1.0$), $F(1, 85) = 27.9$, $p < .001$, $\eta^2 = 0.25$. In comparison, in the small secret condition, there was no significant difference between the highly divergent idea generation task ($M = 3.74$, $SD = 0.94$) and the less divergent idea generation task ($M = 3.88$, $SD = 1.55$), $F(1, 85) = 0.13$, $p = 0.72$, $\eta^2 = 0.001$. The second regression was of the outcome variable (distance thrown) on the independent, mediator, and moderator variables. The

results of this second regression demonstrated that, first, the interaction between the significance of the secret and the idea generation task is no longer significant, indicating full mediation, and that, second, the interaction between feeling liberated and the significance of the secret had a negative effect on the distance thrown (i.e. the more liberated the participants felt the more on target they were when throwing the bean bag). However, these results were not statistically significant. Nevertheless, significance is not a prerequisite to testing formal mediation models through a bootstrapping procedure (Hayes, 2013). Our a priori hypothesis was thus confirmed in the bootstrapping procedure, which revealed a significant indirect effect of the type of brainstorming task on distance thrown via feeling liberated in the big secret, but not in the small secret condition. These results can be found in Table 3b.

Insert Table 3b about here.

General Discussion

The results of three studies showed that the opportunity to be creative feels liberating—feelings that can, in turn, lift the physical burden of secrecy. The results of study three also showed that the unburdening effect of creative work was strongest when the task permitted wide-ranging exploration across different types of ideas, rather than a specific focus in one domain. In other words, though creativity can emerge from focused persistence (Nijstad, De Dreu, Rietzschel & Baas, 2010), it is unlikely to have an unburdening effect.

Future research might investigate how long the unburdening effect will last or whether repeated acts of creativity might desensitize people to the unburdening effect. Longitudinal research that might include a longer delay between the creativity task and the measure of physical burden would be valuable. It is possible, given the relief that being creative affords,

that people who conceal big secrets might be more likely to become singularly absorbed in their work (Csikszentmihalyi, 1997). Future research might also investigate the relationship between secrecy and dishonesty. One implication of our results is that creative work might enable people to keep secrets more effectively because they are less burdened by them (Gino & Ariely, 2012). Secrecy and dishonesty might also differ in important ways that might be interesting to investigate. Individuals who keep a secret are subject to a host of negative social, psychological, and physical outcomes (Vrij et al., 2002). In contrast, when individuals are dishonest, they might believe they will feel guilty but, in fact, feel more self-satisfied and experience heightened positive affect (Ruedy, Moore, Gino, & Schweitzer, 2013).

Our findings make several important contributions to research on secrecy and creativity. The three studies offer a conceptual replication of recent work showing that harboring a big secret can be experienced as a physical burden (Slepian et al., 2012) and they also extend this work in two important ways. First, we showed that one's sense of physical burden is lifted by feelings of liberation from constraint which is consistent with the notion that thought suppression may be the reason that keeping a big secret weighs people down (Slepian, et al., 2014). Creative tasks afford the opportunity for uninhibited expression as opposed to careful suppression. Second, the results also extend this research by demonstrating how the burden of secrecy can be lifted without directly confessing the secret (Slepian et al., 2014). Indeed, channeling this burden into creative pursuits may not only ease psychological burdens but also inspire creative production (Kim, Zeppenfeld & Cohen, 2013). This outlet is particularly important given there are many settings, such as the workplace, in which revealing secrets might be inappropriate or even damaging (Phillips, Rothbard, & Dumas, 2009). Our results are also interesting in light of the movement to de-fund arts education, particularly in poorer schools (Holcomb, 2007). As this

movement to limit access to creative pursuits picks up steam, we may be shutting off a valuable outlet that could relieve the most burdened among us.

Finally, this work also contributes to a growing new direction in research on creativity. Rather than view creativity as a dependent variable to understand the conditions that stimulate it, there is a growing movement toward viewing creativity as an important psychological experience that can lead to many other downstream consequences yet to be explored. People who are psychologically burdened may seek out creative work as a palliative; hence the finding that people with severe mental illnesses are over-represented in the arts (Jamison, 1994). In sum, our research suggests that creative work has sweeping emotional (liberation), physical (throwing distance) and social (pro-social behavior) consequences.

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Table 1a: Test of Mediated Moderation

Antecedent	ME (feeling liberated)			Y (distance thrown)		
	Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>
Creative vs. Practical Idea Generation	0.44	0.25	0.08	-1.92	6.12	0.75
Small vs. Big Secret	-0.98	0.24	0.0001	43.29	17.29	0.01
Feeling Liberated	-	-	-	0.55	3.00	0.86
Idea Generation x Secret	1.61	0.35	<0.0001	-5.22	11.74	0.66
Secret x Feeling Liberated	-	-	-	-9.79	4.93	0.05
Constant	3.88	0.16	<0.0001	13.50	12.30	0.28

$R^2 = .41$
 $F(3, 103) = 23.8106, p < 0.0001$

$R^2 = .20$
 $F(5, 101) = 4.924, p = 0.0004$

Table 1b: Inference for the Conditional Indirect Effects of the Brainstorming Task on the Distance Thrown at the Small and Big Secret Levels and Bootstrap Confidence Intervals (CI)

	Secret	B	SE	95% Bias-Corrected Bootstrap CI
Mediator: feeling liberated	Small	0.24	1.59	-2.25 to 4.72
Mediator: feeling liberated	Big	-21.36	8.66	-39.82 to -6.20

Table 2a: Test of Mediated Moderation

Antecedent	ME (feeling liberated)			Y (carrying books)		
	Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>
Creative vs. Practical Idea Generation	0.03	0.33	0.93	-0.24	0.39	0.54
Small vs. Big Secret	-0.50	0.32	0.12	-1.31	0.78	0.10
Feeling Liberated	-	-	-	0.98	0.14	<0.0001
Idea Generation x Secret	1.42	0.46	0.002	-0.30	0.58	0.61
Secret x Feeling Liberated	-	-	-	0.46	0.20	0.02
Constant	3.67	0.23	<0.0001	-0.86	0.59	<0.0001
	$R^2 = .13$			$R^2 = .56$		
	$F(3, 146) = 7.05, p=0.0002$			$F(5, 144) = 36.01, p<0.0001$		

Table 2b: Inference for the Conditional Indirect Effects of the Brainstorming Task on the Number of Books Carried at the Small and Big Secret Levels and Bootstrap Confidence Intervals (CI)

	Secret	B	SE	95% Bias-Corrected Bootstrap CI
Mediator: feeling liberated	Small	0.03	0.32	-0.62 to 0.63
Mediator: feeling liberated	Big	2.08	0.51	1.08 to 3.18

Table 3a: Test of Mediated Moderation

Antecedent	ME (feeling liberated)			Y (distance thrown)		
	Coeff.	SE	p	Coeff.	SE	p
High vs. Low Divergence	-0.14	0.38	0.7227	-2.48	7.80	0.75
Small vs. Big Secret	-1.18	0.38	0.0024	29.15	16.62	0.08
Feeling Liberated	-	-	-	-1.50	3.11	0.63
Idea Generation x Secret	2.14	0.54	0.0002	-6.22	4.41	0.16
Secret x Feeling Liberated	-	-	-	-9.39	12.63	0.46
Constant	3.88	0.27	<0.0001	21.06	13.27	0.12

$R^2 = .25$
 $F(3, 85) = 9.43, p < 0.0001$

$R^2 = .19$
 $F(5, 83) = 3.82, p = 0.0036$

Table 3b: Inference for the Conditional Indirect Effects of the Brainstorming Task on the Distance Thrown at the Small and Big Secret Levels and Bootstrap Confidence Intervals (CI)

	Secret	B	SE	95% Bias-Corrected Bootstrap CI
Mediator: feeling liberated	Small	0.21	1.68	-1.78 to 5.92
Mediator: feeling liberated	Big	-15.46	5.43	-29.00 to -6.90

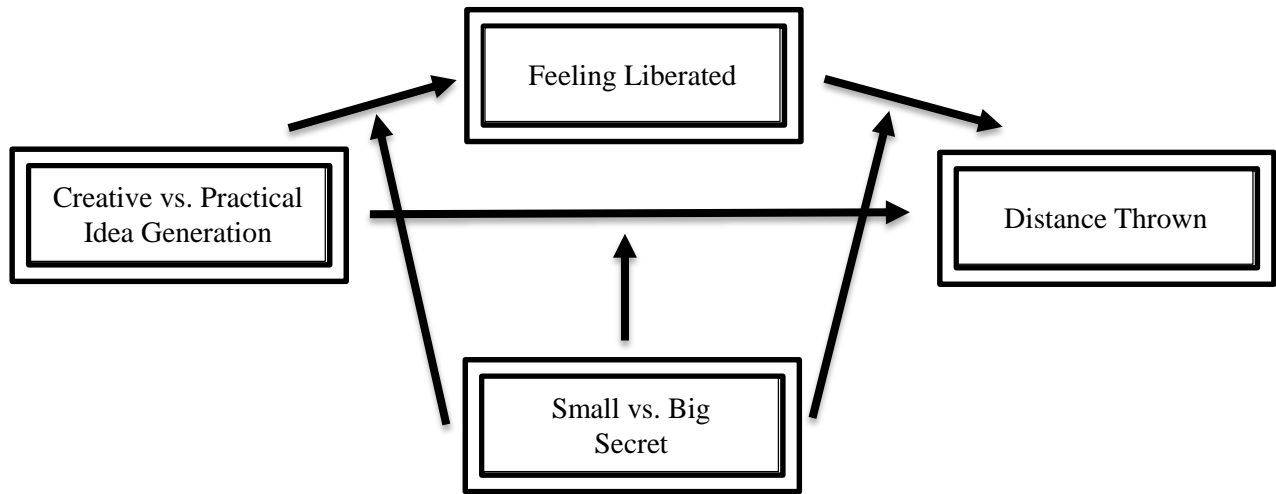


Fig 1a: Mediated Moderation Model for Study 1.

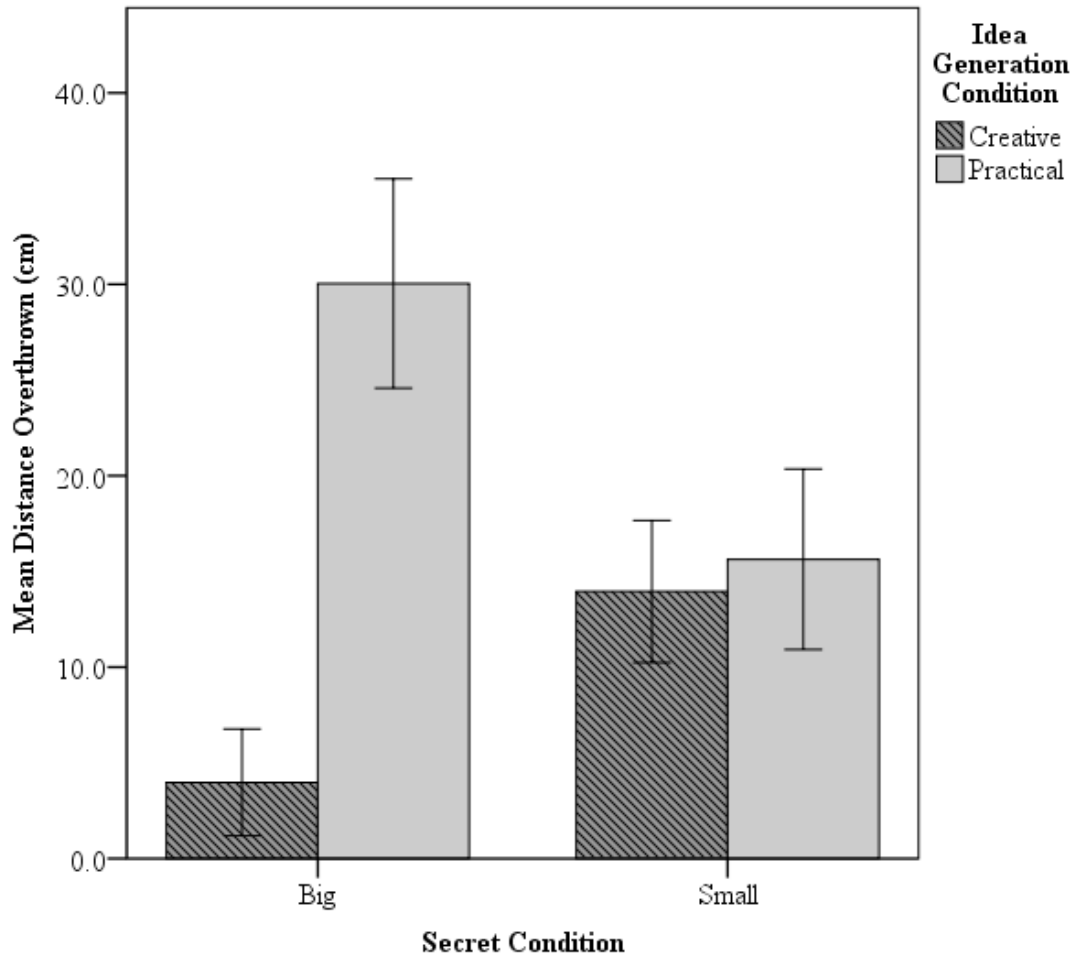


Fig 1b. Mean distance overthrown in centimeters for Study 1 as a function of experimental condition. Error bars represent standard errors.

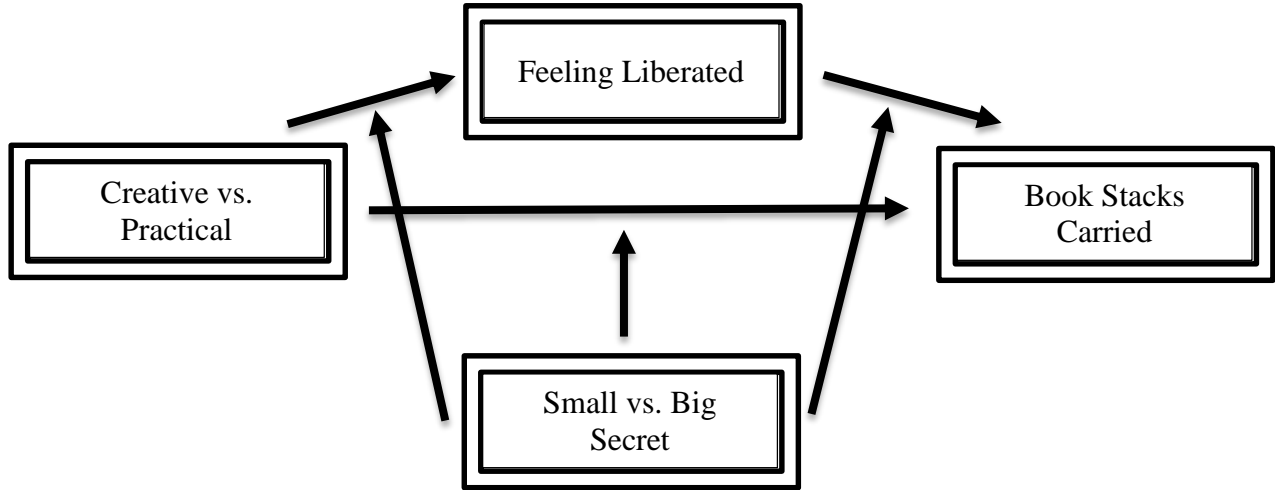


Fig 2a: Mediated Moderation Model for Study 2.

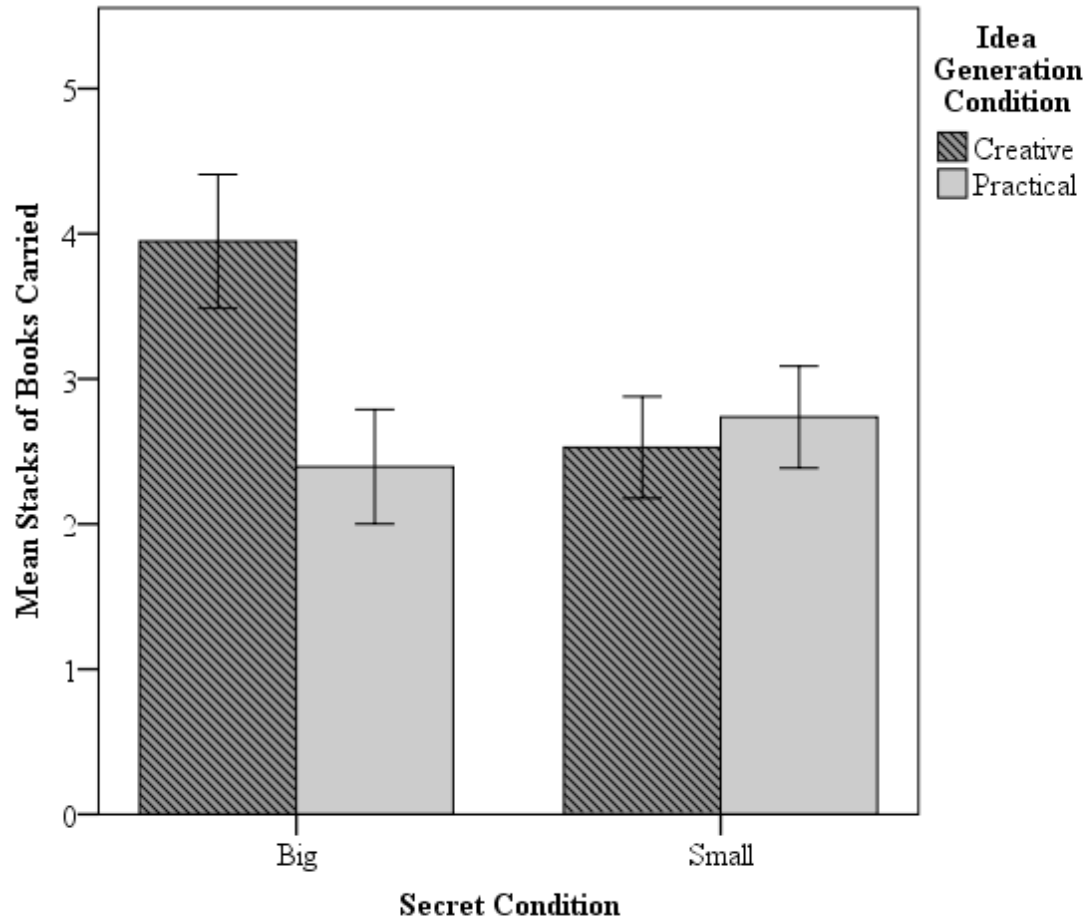


Fig 2b. Mean number of book stacks carried for Study 2 as a function of experimental condition. Error bars represent standard errors.

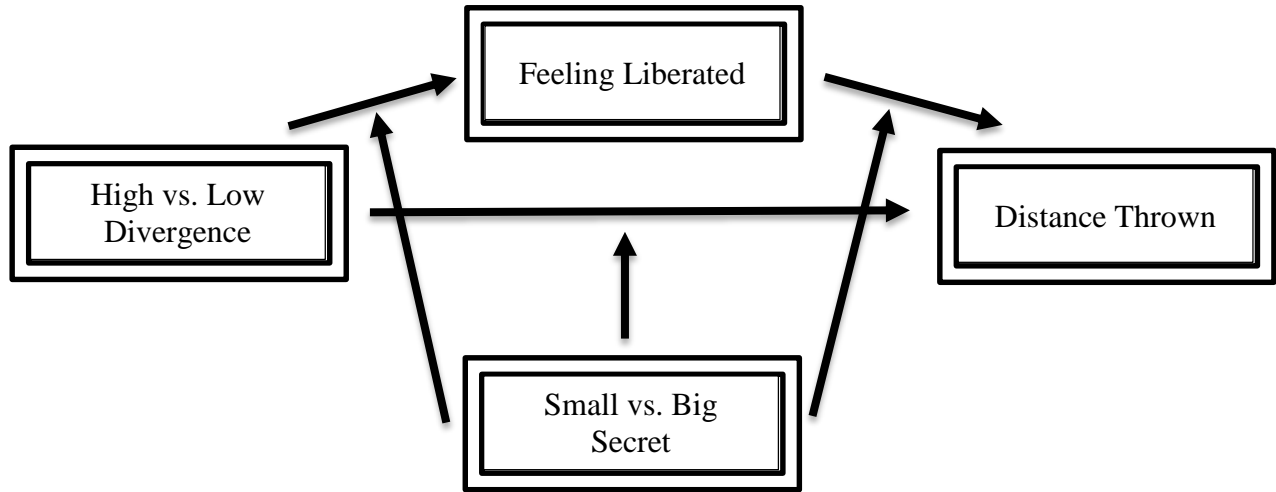


Fig 3a: Mediated Moderation Model for Study 3.

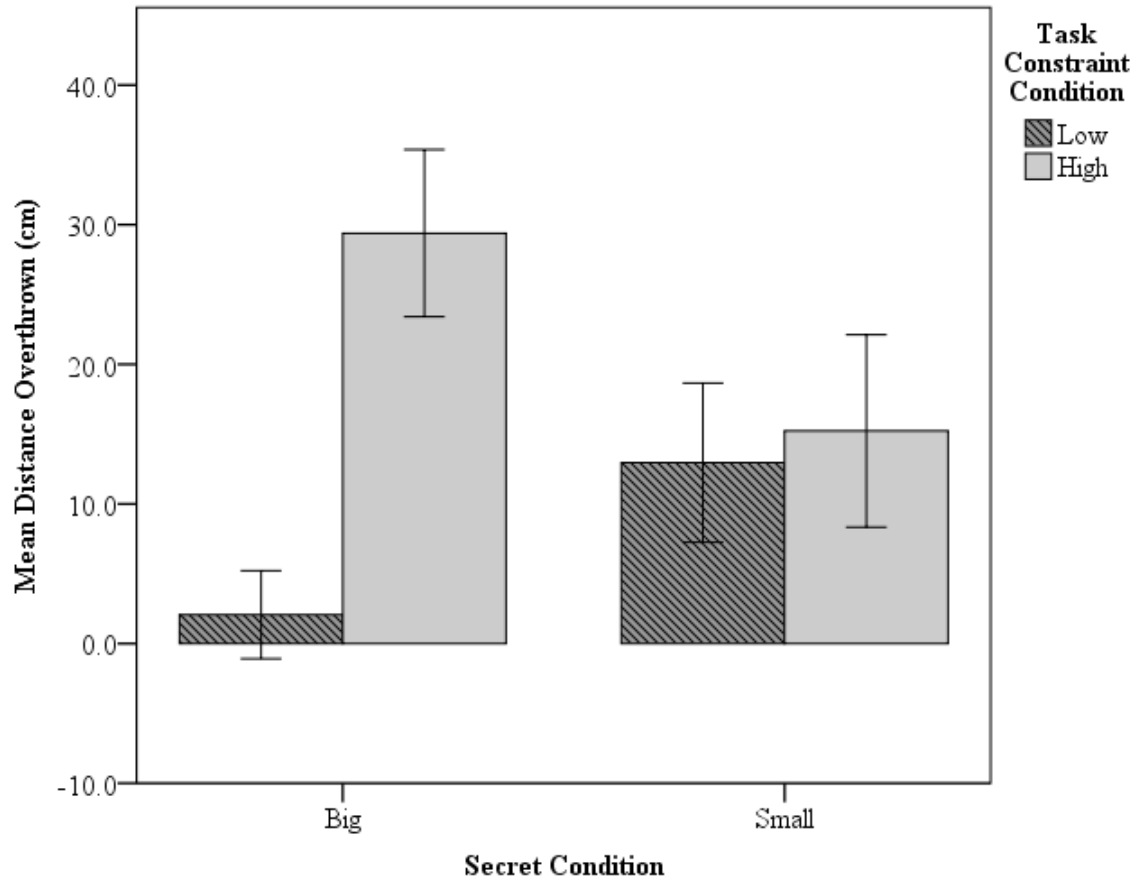


Fig 3b. Mean distance overthrown in centimeters for Study 3 as a function of experimental condition. Error bars represent standard errors.

The Consequences of Creative Work:

How a Creative Outlet Lifts the Burden of Secrecy

Supplementary Analyses

We conducted additional analyses to rule out the possibility that the creative task, rather than contributing specifically to feelings of liberation, impacted affect in a more general way. After completing the physical burden measures, participants then completed measures of positive affect (reliability ranged from $\alpha=.74$ to $.84$) and negative affect ($\alpha=.74$ to $\alpha=.91$) using the PANAS-X (Watson, Clark, & Tellegen, 1988). Across all three studies, there was no evidence that general positive/negative affect explained our results.

Study 1: Additional Analyses

The results of a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) ANOVA on the negative affective scale of the PANAS revealed no significant main effect of secrecy, $F(1, 103) = 1.78, p = 0.19, \eta^2=.02$, no significant main effect of the idea generation task, $F(1, 103) = 0.003, p = 0.96, \eta^2<0.001$, and no significant interaction, $F(1, 103) = 1.22, p = 0.27, \eta^2=0.01$.

The results of a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) ANOVA on the positive affective scale of the PANAS also revealed no significant main effect of secrecy, $F(1, 103) = .81, p = 0.37, \eta^2=.008$, no significant main effect of the idea generation task, $F(1, 103) = .44, p = 0.51, \eta^2=0.004$, and no significant interaction, $F(1, 103) = .72, p = 0.40, \eta^2=0.007$.

Study 2: Additional Analyses

The results of a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) ANOVA on the negative affective scale of the PANAS revealed no significant main

effect of secrecy, $F(1, 146) = 0.001, p = .97, \eta^2 < .001$, no significant main effect of the idea generation task, $F(1, 146) = 0.01, p = 0.92, \eta^2 < .001$, and no significant interaction, $F(1, 146) = 1.78, p = 0.19, \eta^2 = 0.01$.

The results of a 2 (Secret: big versus small) x 2 (Idea generation: creative versus practical) ANOVA on the positive affective scale of the PANAS also revealed no significant main effect of secrecy, $F(1, 146) = .03, p = 0.87, \eta^2 < .001$, no significant main effect of the idea generation task, $F(1, 146) = .57, p = 0.45, \eta^2 = 0.004$, and no significant interaction, $F(1, 146) = .001, p = 0.98, \eta^2 < .001$.

Study 3: Additional Analyses

The results of a 2 (Secret: big versus small) x 2 (Divergence in idea generation task: high versus low) ANOVA on the negative affective scale of the PANAS revealed no significant main effect of secrecy, $F(1, 85) = 1.71, p = 0.20, \eta^2 = 0.02$, no significant main effect of the idea generation task, $F(1, 85) = .3, p = 0.59, \eta^2 = 0.004$ and no significant interaction $F(1, 85) = .65, p = 0.42, \eta^2 = 0.008$.

The results of a 2 (Secret: big versus small) x 2 (Divergence in idea generation task: high versus low) ANOVA on the positive affective scale of the PANAS revealed no significant main effect of secrecy, $F(1, 85) = < .001, p = 0.99, \eta^2 < .001$, no significant main effect of the idea generation task, $F(1, 85) = .001, p = 0.98, \eta^2 < .001$ and no significant interaction $F(1, 85) = .04, p = 0.84, \eta^2 < .001$.