Abstract

By Samantha J. Miller

The main goal of this study was to examine loneliness as an impetus or hindrance for creativity. In order to do so, loneliness was manipulated. Loneliness was primed by asking participants to visualize themselves as college freshmen, alone in their room without any friends, whereas connectedness was primed by asking participants to visualize themselves with a supportive friend. Participants were then asked to create a slogan and were informed that they could get money ($25) for creating a creative slogan. Relevance of the creativity outcome was manipulated by asking either what the participant would like to spend his or her money on (self-relevance), or to which organization he or she would like to donate the money to (group-relevance). It was assumed that when people are made to feel lonely, they would be more creative, but only if they felt that their creativity would not alienate them from a group. Second, if people feel that being creative alienates themselves from a group, they will be less likely to express themselves, but only if they feel lonely. It was therefore predicted that participants would be more creative in the group relevance condition than the self-relevance condition when they were made to feel lonely because they would want to engage with the group to reconnect to others. Second, it was predicted that participants in the connectedness condition would not be particularly creative in either the self- or group relevance condition due to having their connectedness needs fulfilled, which would remove the need to engage with a group and also alleviates feelings of guilt from attempting individuation. Analyses suggested that loneliness did not have a significant effect on creativity, while relevance had a marginally significant effect on creativity. Participants in the self-relevant condition tended to produce more creative slogans than those in the group-relevance condition. These results go against both hypotheses for this study. A discussion of these effects and ideas for follow-up work are included in the discussion section.

LONELINESS, GROUP RELEVANCE, AND CREATIVITY

by

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Loneliness, Group Relevance, and Creativity

Creativity is a concept that adds verve to life. While various research has been done on creativity (see Landau, Sullivan & Solomon 2010 for a review), research on what influences creativity is sparse. In our internet-connected world where face-to-face contact is decreasing, it would seem that people are left alone with their thoughts more and more often. The combination of isolation and self-focus brings an interesting question to the fore: are people more creative when they feel lonely?

For the purposes of this study, creativity can be defined as unconventional uses of or ideas about an object or concept. There exist various definitions of creativity in the literature. Runco and Jaeger (2012) examine the standard definition of creativity, where both originality and effectiveness are required for something to be creative. It would seem that effectiveness can supersede originality as a requirement for creativity at times, and that the originality and effectiveness definition is a modern one. According to Runco and Jaeger (2012), a brief literature search for creativity-related terms suggests that the word creativity itself is rarely mentioned and instead terms such as "valuable inventiveness" are used to describe the concept.

Loneliness and its Action Tendencies

The current study follows the following definition of loneliness: loneliness is defined as an unpleasant feeling or experience coming from social isolation. Regarding other definitions that can be found in the literature, de Jong Gierveld (1998) provides a similar definition of loneliness. Loneliness is still defined as an unpleasant experience,

but emphasis is placed on the quantitative or qualitative deficiency of relationships. However, because this definition is one-dimensional, de Jong Gierveld also provides a multi-dimensional definition that focuses on the sense of deprivation, the time perspective of a lonely person (whether loneliness is considered permanent or changeable), and the other emotions involved in feeling lonely. It should be noted that a definition of positive loneliness exists: the German concept of Einsamkeit, which involves a willing withdrawal from a person's social life to focus on matters such as reflection or meditation. Probing this particular concept and its relationship to creativity is outside the scope of this study, however, and the first conceptualization presented was the one used in the current study to guide the operationalization of loneliness.

To address the question of whether or not people are more creative when they feel lonely, one must look at the background theory. The first area to examine would be the research on loneliness. Mikulincer, Shaver, and Pereg (2003) discussed attachment, cognition, and affect, concepts that relate to loneliness in that seeking increased attachment is a way to alleviate loneliness. Using Bowlby's (1982) attachment theory as a theoretical framework, the discussion holds that humans tend to seek their attachment figures in times of need. One such time of need would be situations of loneliness. Therefore, through this discussion, the first key tenet of the background theory is that loneliness prompts a need for affiliation by increasing attachment to other people.

However, loneliness increases attachment to other entities than just other people. Epley, Akalis, Waytz, and Cacioppo (2008) performed a series of experiments on people's attachments to non-humans. They held that, when isolated, people would create

attachment figures out of non-human entities to assuage the feelings of loneliness and disconnection. The first experiment assessed the tendency to anthropomorphize objects, or "gadgets." Participants completed an online survey in which they rated the anthropomorphic mental-state attributes of several technological gadgets. These gadgets included Clocky, an alarm clock with wheels that "runs away" so that one has to get up to turn it off; CleverCharger, a battery charger that prevents overcharging; Pure Air, an air purifier for people with allergies or respiratory problems; and Pillow Mate, a torso-shaped pillow that can be programmed to give hugs. The mental-state attributes being rated included whether the object had "a mind of its own," had "intentions," had "free will" and "consciousness," and "experienced emotions." Loneliness was found to be correlated positively with the anthropomorphic mental state ratings, suggesting that loneliness can cause creative attributions to objects.

The second experiment was intended to address the problem of the first one's purely correlational results (that is, correlation alone cannot demonstrate whether social disconnection caused the results or not). This experiment assessed the tendency for lonely people to seek connection with gods or related divine entities. Participants (half who said yes when asked if they believed in God, half who said no when asked if they believed in God) took a computerized version of the Eysenck Personality Questionnaire and were given a randomly selected paragraph of "future life predictions" to manipulate social connection. Those in the disconnected condition were told that they were likely to be lonely in life, while those in the connected condition were told the opposite. The participants were then asked to rate their beliefs in ghosts, angels, miracles, curses, the

Devil, and God. The researchers found that, as predicted, the loneliness manipulation did increase belief in divine entities in both believers and non-believers, though believers had higher belief ratings overall as expected.

The third experiment in the series intended to increase the generalizability of the results from the prior two studies and examine whether negative affect alone was responsible for the earlier results as opposed to loneliness. To manipulate loneliness or disconnection, undergraduates were asked to watch one of three video clips. Based on random assignment, students were assigned to one the following three experimental conditions: the disconnected, fear, or control conditions (the fear condition was intended to assess the effect of negative affect). In the disconnected condition, participants watched a segment from *Cast Away* in which the protagonist experiences isolation on a desert island. In the fear condition, participants watched a segment from *Silence of the Lambs* where the protagonist chases a serial killer. Finally, in the control condition, participants watched a segment from *Major League* in which baseball players interact with a crowd of people after a win. It should be noted that the *Major League* clip only served as a control in that it had interaction with other people (unlike the other two clips) and did not involve fear or loneliness. After watching the clips, participants filled out the divine belief questionnaire used in the second experiment. The researchers used a second measure where participants were asked to think of a pet they either owned or knew well and pick from a list of traits to describe the pet. Three traits involved anthropomorphism and social connection, four traits involved anthropomorphism and were less related to social connection, and seven traits were simply behavioral descriptions. Following this

measure, a third measure was employed where the participants saw 20 ambiguous figures and were asked to report what they saw in them (the researchers were looking for how many faces would be detected in the figures).

As in the second experiment, belief in the divine was found to be increased in participants who were in the disconnected condition. For the pet description measure, participants in the disconnected condition were more likely to use the social connection-related traits to describe the pet than those in the control or fear conditions. Finally, for the measure with the ambiguous figures, participants in the fear condition were more likely to report seeing faces than those in the other conditions. The conclusions supported the original hypotheses as set forth by the experimenters. The results indicate that loneliness, and not just any sort of any negative affect, is what specifically causes the anthropomorphization and attribution of mental states to non-human objects. This set of experiments provides support for the idea that loneliness can cause attachment to non-human entities (see also Keefer, Landau, & Sullivan (2014) for further discussion of this idea).

Keefer et al. (2014) also presented a novel concept, which is that lonely people may derive social support from people who do not exist. The concept was empirically supported in a series of experiments by Derrick, Gabriel, and Hugenberg (2009). They labeled these relationships with fictional characters *parasocial relationships*. Parasocial relationships fit into what they call the social surrogacy hypothesis, according to which these relationships fulfill social needs despite not being true social interactions. The first study in the series was intended to provide a correlational base for the social surrogacy

hypothesis. It was hypothesized that participants would report watching a favored television program as a desired activity when belongingness needs were aroused, and that participants would report feeling less lonely when watching this program as opposed to other programs or performing other non-social activities. Undergraduate students filled out two measures: the lonely activities scale and the likelihood of feeling lonely scale. The lonely activities scale consisted of 31 activities, and each participant had to rate how likely they were to perform each activity when feeling lonely from 1 (definitely would not do) to 7 (definitely would do). On the likelihood of feeling lonely scale, participants rated how likely they would be to feel lonely when performing each activity, from 1 (definitely would feel lonely) to 7 (definitely would not feel lonely). There was also an option for 0, which indicated that the participant would not perform the activity. Watching a favored television program was one of the top two activities participants engaged in when lonely, and it was performed more often than watching whatever was on television. Participants also reported feeling less lonely while watching a favored television program than while performing any of the other activities.

The second experiment in the series examines experimentally what the first one found using a correlational design. For this experiment, the authors predicted that participants with aroused belongingness needs would write for longer about a favored television program than those who did not have the needs aroused. First, participants wrote the essay that would manipulate arousal of belongingness needs. Participants in the Aroused Needs condition wrote about a time they fought with a close other, while participants in the control condition listed as many items in their home as they could

remember. Next, participants wrote an essay about a time where they either watched a favored television program or whatever was on television. The length of time spent writing the essays was the primary dependent measure. As predicted, participants in the Aroused Needs condition wrote for longer about a favored program than those who did not have the needs aroused. Those in the Aroused Needs condition also wrote for longer about a favored program than just "any" program, indicating that the loneliness buffering effect is not a product of escapism.

For the third experiment, the authors predicted that parasocial relationships could buffer against mood state changes caused by perceived threats to social relationships. More specifically, they predicted that recalling a relationship threat would lower self-esteem and mood, and increase feelings of rejection. Writing about a favored television program would mitigate the effect. In the experiment itself, participants first filled out a measure of global self-esteem. The results were treated as a covariate to control for self-esteem levels. After filling out the self-esteem measure, the participants either wrote about a fight with a close other or listed items in their home. After the first essay, the participants wrote about a time when they watched either a favored television program or any program that was on at the time. Participants then filled out two measures of self-esteem, a measure of mood, and a measure of feelings of rejection. These measures were the primary dependent measures. The authors found results in line with the predictions. Recalling a relationship threat lowered self-esteem and increased negative mood and feelings of rejection, but writing about a favored television program mitigated the effects.

The fourth and final experiment in the series served to answer the question of whether the buffering against negative feelings found in the third experiment was caused by general positive experience as opposed to actually having belongingness needs satisfied. The authors predicted that they would find that favored television programs fulfilled belongingness needs as opposed to just boosting mood. The way this fulfillment would be indicated in the context of the experiment would be filling in word stems with words that did not focus on exclusion, indicating a lack of access to belongingness concepts. In the experiment, participants started out writing one of three essays: about a favored television program, about programs watched when nothing else of interest was on, or about an academic success. These essays were part of the parasocial manipulation; the academic success topic was a non-social control intended to answer the question of whether general positive experiences created the buffering effect in the third experiment. The participants were then asked to perform word completions. Each word stem could be completed in more than one way. There were three word stems that could possibly lead to exclusion-related words, eight negative non-exclusion-related words, and five positive non-exclusion-related words; the remaining words were filler words. Participants that wrote about a favored television program filled in less word stems with exclusion-related words, indicating a lack of access to belongingness concepts due to satisfaction of belongingness needs.

How do all of these experiments fit together? Derrick et al. (2009) provide support for the idea that loneliness can cause attachment to fictional figures. To reiterate, the other two key ideas are that loneliness causes attachment to other people and to non-

human entities. These three concepts are vital to understanding the argument being set forward, that loneliness makes people more creative. The use of non-human entities for social support could be interpreted as creativity, as by definition an unconventional use is being applied to something. Therefore, when a lonely person is making use of non-human or fictional entities for comfort, they are engaging in creativity. Alongside that, it has been empirically shown that loneliness increases the need to belong and causes action tendencies towards affiliation. Though there has not been much research on loneliness and creativity, research has been done on mortality salience and creativity, which uses a similar paradigm. Such research will be described below.

Fear of Own Death and Creativity

Landau, Sullivan, and Solomon (2010) wrote a very in-depth discussion of loneliness, fear of death, and creativity. The discussion begins by using mortality salience as a framework. Specifically, Terror Management Theory as inspired by the work of Ernest Becker formed the groundwork for the ensuing discussion. It holds that humans have a natural biological disposition towards survival, along with a unique symbolic intelligence that allows for thinking about the past, present and future, along with the inevitability of death. The awareness of death conflicts with survival goals and creates a specific form of anxiety termed terror. There are two structures that buffer against terror: the cultural worldview, or socially constructed beliefs that lend meaning to life and the universe, and self-esteem, the perception that a person contributes to more than just their own existence. With these concepts in mind, the authors move onto presenting the

mortality salience hypothesis, which proposes that when mortality is made salient, people will have a stronger need to support the cultural worldview to buffer against terror. In action, mortality salience spurs a desire to secure a legacy.

Simonton (1989) performed an analysis of the works of roughly 2000 composers and found that, as the composers reached the ends of their lives, their works became less controversial and more popular. It would seem that these composers stripped the unconventional aspects from their music to secure their place in the cultural worldview and buffer against their own terror. One could argue that their works became *less* creative as they neared death. Fear of death can be considered akin to fear of loneliness because for some, death may result in the ultimate loneliness as they are permanently separated from friends and family. This means that according to this study, fear of loneliness was associated with less creativity.

Group Relevance as a Moderator of the Relationship between Loneliness and Creativity

Landau, Sullivan, and Solomon (2010) added another aspect onto currently existing creativity paradigm. How relevant self-expression of creativity is to a person's group can either curtail or promote creativity. Self-expression can be defined as personal acts that are specific to a person and thus may make them stand out. Self-expression's relevance to a group lies in its ability to cause alienation or identification. If self-expression is not considered to be in line with a group's goals or ideals, people will feel guilty for expressing themselves and thus be less creative. Likewise, if self-expression

can be considered relevant to or helping the group, people will not feel guilty for expressing themselves and will be more likely to be creative. In other words, group relevance and fear of alienation are key components to the creativity paradigm being used for the current research.

In sum, all of the cited literature suggests loneliness as a catalyst for creativity. Creativity can serve to address the needs for affiliation that loneliness creates as people create attachment figures outside of other people. Landau et al.'s (2010) examination also adds a modifier to the loneliness-creativity relationship in the form of group relevance. Specifically, whether or not people feel that self-expression will alienate them from their group affects their creativity. If they fear alienation, they will be less creative to avoid feeling guilt. If people do not fear alienation or there is no group to check acceptability with, they will be more creative.

Current Study and Hypotheses

There were two assumptions in play for the current study. First, if people are made to feel lonely, they will be more creative, but only if they feel that their creativity will not alienate them from a group. Second, if people feel that being creative will alienate themselves from a group, they are less likely to express themselves, but only if they feel lonely.

For the experiment, participants were first asked to visualize and write down one of two scenarios: visualizing themselves as a freshman that had just started school and was alone with no friends, or visualizing a time they spent with a close friend who was a

strong source of support and acceptance. The visualization task was used to manipulate

connectedness, as the scenarios primed for loneliness and connectedness, respectively.

After the visualization task, participants received a packet with the group relevance

manipulation in it. In the self-relevance condition, participants were asked what they

would spend money from the task on, while in the group relevance condition, participants

were asked which school organization they would donate money from the task to. In both

conditions, the task was to create a slogan for a product that would be sold as part of a

fundraiser (based off a measure used in Chen & Segupta 2014).

Hypotheses

When participants received *the loneliness prime*, they would be more creative in

the group relevance condition than the self-relevance condition. This is because

participants made to feel lonely would want to avoid individuating themselves too much

to avoid further alienation from the group. Conversely, if they feel self-expression would

help them bond with a group, they would be more creative. These conditions will result

in the lowest and highest amounts of creativity, respectively. There will be a large

difference between the two conditions and a large effect size for creativity in general.

No or little difference is expected in the *connectedness condition* as a function of

the relevance manipulation. Those primed for connectedness will not feel particularly

concerned about alienating themselves or attempting to further connect with their group,

and so their creativity will be hindered. In general, a small effect size is expected for

creativity in the connectedness condition. The predictions for the results of the

experiment are summarized in Table 1.

Table 1. Predictions for Creativity Levels across Conditions

Self or Group Relevance	Loneliness	Connectedness
Self-Relevance	Lowest	Low
Group Relevance	Highest	Low

Method

Participants

Participants were recruited from the University of Wisconsin Oshkosh psychology department participant pool. They were recruited using the SONA online signup system. A total of 104 participants were tested in the experiment. The average age of the participants was 19.48 years, $SD = 3.02$. There were 75 women and 29 men participating; 84 of the participants were Caucasian, seven were African-American, seven were Asian, five were Hispanic, and one did not fit into those categories. Overall, 63 participants were freshmen, 20 were sophomores, twelve were juniors, seven were seniors, and two participants fit into a miscellaneous category. Participants received one course credit for introductory psychology courses in exchange for being a part of the study and were tested individually.

Procedure

To begin, participants first received an informed consent sheet and were asked to sign it if they wished to participate in the study (see Appendix A for the consent document). Once their consent was received, they were given a cover story. They were told that the study was looking to examine the effects of visualization on various aspects of life, including mood (see Appendix B for the instructions).

Manipulation of Connectedness. After signing the consent forms, participants were handed papers that assigned them to one of two visualization priming conditions used to manipulate connectedness (see Appendices C and D). In the *loneliness priming*

condition, the instructions told the participants to visualize themselves as a freshman that

had just started school and was alone with no friends. The participants in *connectedness*

priming condition were asked to visualize a time they spent with a close friend who was a

strong source of support and acceptance. The participants were given ten minutes to write

down their visualizations. Following the visualization task, the participants filled out a

mood rating questionnaire that assessed the emotions they experienced right after the

visualization task (see Appendix E).

      Manipulation of Relevance. Once the priming task was complete, the next step

was to create the two conditions of the second independent variable (relevance: group

versus self-relevance). Participants were handed a packet with the instructions for an idea

generation task. The text of the packet was different depending on the self-relevance or

group relevance condition (see Appendices F and G). In the *self-relevance condition*,

participants were asked what they would spend money received from the task on; in the

group relevance condition, participants were asked which school organization they would

like to donate money from the task to. In both conditions, the idea generation task

involved creating a slogan for a product that would be sold as part of a fundraiser.

Participants were given ten minutes to write their ideas and to select one slogan that

would be coded. There was an incentive listed to promote creativity; it was said that the

creator of the most creative slogan would receive $25. In reality, the winner of the money

was determined randomly, after the study was concluded. When time was up, the

participant was given a demographics questionnaire, which included questions about the

participant's age, gender, and ethnicity, the manipulation checks, and a measure of

identification with the group (assessed with 7 items, on a scale running from 1 to 7, Cronbach's α = .86). After the demographics questionnaire, participants were debriefed verbally and given a debriefing sheet to easily allow for explaining the experiment's true purpose and checking for suspicion. The debriefing concluded that experiment session.

Manipulation Checks

The demographics questionnaire contained the manipulation checks assessing accurate recall of the type of visualization task the participant completed and a self-report on how the participant would spend the money from the fundraiser. There were questions that asked if the participant remembered which visualization task they performed (going on a walk, friends being unavailable, a supportive friend, or a different condition) (a manipulation check for the loneliness manipulation) and if they remembered whether they were spending the money on themselves or for a school organization (a manipulation check for the relevance manipulation). The mood questionnaire presented after the visualization task also contained manipulation checks in its items. The items "connected" and "lonely" were averaged into one "loneliness" emotion index, and served to confirm whether or not the visualization tasks truly instilled loneliness or connectedness in the participant.

Dependent Measures

The main measure of the dependent variable, creativity, was based on the slogans generated for the product. A coding system similar to what was suggested in Silvia et al.

(2009) was used; that is, independent coders were asked to rate the slogans on a scale from 1 (least creative) to 5 (most creative). The coders also were asked to give separate ratings for humor and novelty, as those were deemed to be components of creativity; a rating of 0 marked those qualities as absent, while a rating of 1 marked those qualities as present. Three coders were used to measure creativity, including the researcher. All three coders were kept blind to what conditions the participants were in prior to creating the slogans. Cohen's K was run to determine if there was agreement between the judges' ratings of slogan creativity. Between coders one and two, there was a small but significant amount of agreement in ratings, $\kappa = .198$, $p < .001$. Between coders one and three, there was a small but insignificant amount of disagreement, $\kappa = -.026$, $p = .597$. Between coders two and three, there was a small and marginally significant amount of agreement, $\kappa = .089$, $p = .061$. Cohen's K was also run to confirm agreement on the humor and novelty ratings. Between coders one and two, there was a moderate and significant amount of agreement in ratings for humor, $\kappa = .562$, $p < .001$. Between coders one and three, there was a moderate and significant amount of agreement in ratings for humor, $\kappa = .597$, $p < .001$. Between coders two and three, there was a moderate and significant amount of agreement in ratings for humor, $\kappa = .475$, $p < .001$. In terms of novelty, there was a small and significant amount of agreement in ratings between coders one and two, $\kappa = .379$, $p < .001$. Between coders one and three there was a large and significant amount of agreement, $\kappa = .788$, $p < .001$. Lastly, between coders two and three there was a moderate and significant amount of agreement, $\kappa = .447$, $p < .001$. Due to the discrepancies between coders, an average of all three coders' scores was used for

creativity, and a final score based on which ratings agreed was used for novelty and humor.

Results

Manipulation Checks

Visualization Manipulation Checks. One 2x2 between-subjects ANOVA was conducted to assess the effects of the visualization (0 = loneliness versus 1 = connectedness) and relevance conditions (0 = self-relevance versus 1 = group relevance) on a loneliness index (composed of the measures of loneliness and rejection and a reverse-coded connectedness measure from the mood questionnaire; Cronbach's α = .73). There was a significant effect of the visualization condition on loneliness, $F(1, 99) =$ 81.997, p = .00, η^2 = .453. Participants in the loneliness visualization condition reported higher feelings of loneliness than those in the connectedness visualization condition (M = 4.00, SD = 1.41 versus M = 1.83, SD = .89). The effect of the relevance condition on loneliness was not significant, $F(1, 99)$ = .036, p = .851, η^2 = .001. The effect of the interactions between the visualization and relevance conditions on loneliness was also not significant, $F(1, 99)$ = 1.264, p = .264, η^2 = .013. These results suggest that the manipulation was successful.

A chi-square analysis was run to examine participants' recall of the visualization instructions as a function of condition assignment. The overall chi-square was statistically significant, $\chi^2(1)$ = 3.80, p = .051. Moreover, there was a significant association between the two independent variables for the response option, "friends unavailable", $\chi^2(1)$ = 6.09, p = .014. As shown in Table 2, column comparisons revealed that in the self-relevance condition, more participants in the loneliness condition (n = 17) than in the connectedness condition (n = 0) selected the "friends unavailable" response

option, $p < .05$. Similarly, column comparisons revealed that in the group relevance

condition, more participants in the loneliness condition ($n = 14$) than in the connectedness

condition ($n = 6$) selected the "friends unavailable" response option, $p < .05$.

Table 2. Counts of Recalled Condition by Visualization Condition

Recalled Condition	Relev. Condition	Loneliness Visualization	Connectedness Visualization
Friends Unavail.	Self	17a	0b
	Group	14a	6b
Supportive Friend	Self	1a	10a
	Group	0a	12a
Other	Self	15a	11a
	Group	7a	11a
N		54	50

Note: Each subscript letter denotes a subset of visualization categories whose column

portions do not differ significantly from each other at the .05 level. Relev. = Relevance,

Unavail. = Unavailable. Total $N = 104$ participants.

Group Relevance Manipulation Checks. A chi-square analysis was conducted

to examine participants' recall of the group-relevance instructions as a function of

condition assignment. The overall chi-square was marginally significant, $\chi^2(1) = 3.43$, p = .064. However, none of the columns comparisons were statistically significant, all ps>.05 (see Table 3).

Table 3. Counts of Recalled Condition by Relevance Condition

Recalled Condition	Vis. Condition	Self-Relevance	Group Relevance
Spend On Self	Lonely	31a	7a
	Connect	16a	6a
Donate to School Org	Lonely	2a	14a
	Connect	5a	22a
N		54	49

Note: Each subscript letter denotes a subset of visualization categories whose column portions do not differ significantly from each other at the .05 level. Vis. = Visualization, Org. = Organization. Total $N = 103$ participants.

Effects of Loneliness and Group Relevance on Creativity

A univariate 2x2 ANOVA was conducted to analyze the effect of loneliness and group relevance on creativity ratings. The effect of the visualization conditions (loneliness or connectedness) was not significant $F(1, 100) = .560$, $p = .456$, $\eta^2 = .006$.

The effect of the interaction between the visualization conditions and relevance conditions (self or group) was also not significant $F(1, 100) = .851$, $p = .359$, $\eta^2 = .008$. However, the effect of the relevance conditions on creativity was marginally significant $F(1, 100) = 3.424$, $p = .067$, $\eta^2 = .033$. Unexpectedly, creativity tended to be *higher* for the slogans generated in the self-relevance condition ($M = 2.72$, $SD = .83$) than in those generated by the participants in the group relevance condition ($M = 2.34$, $SD = .90$). Posthoc analyses revealed that when participants were made to feel lonely, they were more creative in the self-relevance condition than in the group relevance condition, $p < .05$. Participants were also more creative in the loneliness/self-relevance condition than in the connectedness/group relevance condition, $p < .05$. The means and standards deviations for this dependent measure, as well as for humor and novelty, are displayed in Table 4.

A logistic regression was performed to examine the presence or absence of humor across conditions. Neither the main effects of loneliness and group-relevance nor their interaction was significant, all *Walds* < 2.04, all *exp(B)* < 5.16, all ps $> .15$.

A logistic regression was performed to examine the presence or absence of novelty across conditions. Neither the main effects of loneliness and group-relevance, nor their interaction was significant, all *Walds* $< .82$, all *exp(B)* < 2.19, all ps $> .36$.

Table 4. Means and Standard Deviations of Creativity, Humor, and Novelty by Condition

	Loneliness, Self-Relevance	Loneliness, Group Relevance	Connectedness, Self-Relevance	Connectedness, Group Relevance
Creativity	2.83a (.94)	2.35b (.93)	2.54ab (.60)	2.38b (.90)
Humor	.30a (.47)	.10a (.30)	.14a (.36)	.17a (.38)
Novelty	.39a (.50)	.24a (.44)	.33a (.48)	.34a (.48)
N	33	20	21	29

Note: Parentheses indicate standard deviations. Row means with different subscripts are different at an alpha of .05 or less.

Additional Analyses

Three additional indexes were created for further analysis of results. The first index, sadness, was formed from ratings of "sad" and "sorrowful" on the mood questionnaire, Cronbach's α = .82. The second index, distress, was formed from ratings of feeling "distressed," "upset," and "disturbed," Cronbach's α = .73. The third index, anxiety, was formed from ratings of "anxious," "worried," and "concerned," Cronbach's α = .88.

A univariate 2x2 ANOVA was conducted to analyze ratings on the sadness index across conditions. There was a significant effect of the visualization condition on sadness, $F(1, 99) = 23.695$, $p = .00$, $\eta^2 = .193$. Participants in the loneliness visualization condition reported higher feelings of sadness than those in the connectedness visualization condition ($M = 3.28$, $SD = 1.84$ versus $M = 1.76$, $SD = 1.07$). The effect of the relevance condition on sadness was not significant, $F(1, 99) = .046$, $p = .830$, $\eta^2 = .000$. The effect

of the interactions between the visualization and relevance conditions on loneliness was also not significant, $F(1, 99) = .758$, $p = .386$, $\eta^2 = .008$.

A second univariate 2x2 ANOVA was conducted to analyze ratings on the distress index across conditions. There was a significant effect of the visualization condition on distress, $F(1, 99) = 10.845$, $p = .001$, $\eta^2 = .099$. Participants in the loneliness visualization condition reported higher feelings of distress than those in the connectedness visualization condition ($M = 2.82$, $SD = 1.71$ versus $M = 1.82$, $SD = .93$). The effect of the relevance condition on distress was not significant, $F(1, 99) = 1.501$, $p = .223$, $\eta^2 = .015$. The effect of the interactions between the visualization and relevance conditions on distress was also not significant, $F(1, 99) = 1.929$, $p = .168$, $\eta^2 = .019$.

A third univariate 2x2 ANOVA was conducted to analyze ratings on the anxiety index across conditions. There was a significant effect of the visualization condition on anxiety, $F(1, 99) = 26.667$, $p = .000$, $\eta^2 = .211$. Participants in the loneliness visualization condition reported higher feelings of anxiety than those in the connectedness visualization condition ($M = 3.59$, $SD = 1.90$ versus $M = 1.87$, $SD = 1.32$). The effect of the relevance condition on anxiety was not significant, $F(1, 99) = .058$, $p = .809$, $\eta^2 = .001$. The effect of the interactions between the visualization and relevance conditions on anxiety was also not significant, $F(1, 99) = .203$, $p = .653$, $\eta^2 = .002$.

	Loneliness, Self-Relevance	Loneliness, Group Relevance	Connectedness, Self-Relevance	Connectedness, Group Relevance
Table 5. Means and Standard Deviations of Sadness, Distress, and Anxiety by Condition				
Sadness	3.41a (2.05)	3.08a (1.45)	1.64b (.92)	1.84b (1.18)
Distress	3.09a (1.96)	2.37a (1.08)	1.79b (1.01)	1.84b (.89)
Anxiety	3.57a (2.10)	3.63a (1.58)	2.00b (1.52)	1.77b (1.17)
N	33	20	21	29

Note: Parentheses indicate standard deviations. Row means with different subscripts are

different at an alpha of .05 or less.

Discussion

Effects of Loneliness and Group Relevance on Creativity

After examining the results of the analyses, it can be concluded that loneliness did not consistently affect creativity, as the main effect of the visualization manipulation on creativity was not significant. Nevertheless, the manipulation checks suggest that the loneliness manipulation was successful. A possible reason for why loneliness failed to have an impact on creativity ties into group relevance's effect on creativity, which will be discussed below.

The marginally significant group relevance's effect of creativity merits examination. Specifically, participants tended to be more creative in the self-relevance condition than the group relevance condition, which goes against this study's hypotheses. Nevertheless, the one-way ANOVA post hoc tests suggested that the effect of relevance on creativity was significant in the loneliness condition (see Table 4). The background theory used for this study may provide some explanations for this effect. Landau, Sullivan, and Solomon (2010)'s discussion of group relevance and its ability to curtail or enhance creativity has a caveat: if someone does not fear alienation or there is no group to be alienated from, that person will freely express him or herself. This research raises a question of if the population examined in this study has no fear of alienation from the group they selected. Furthermore, there is the possibility that the group participants in this study selected was not important to them. It is also possible that the selected group was unequally important across participants and conditions, which resulted in different

degrees of motivation to benefit the group within conditions, therefore increasing error-variance.

It is also possible that doing things to cheer oneself up (i.e., winning money for oneself by creating a creative slogan) may have been perceived as a more successful strategy for participants in the loneliness condition than donating money to a group they may not care deeply about. Indeed, additional analyses suggest that the visualization manipulation affected other emotions (sadness, anxiety, and distress): participants in the loneliness condition were sadder, more anxious, and more distressed than participants in the connectedness condition. The strong negative affect in the loneliness condition might have caused participants to engage in negative affect regulation strategies to decrease the negative affect, rather than causing them to seek affiliation with a relevant group.

Another possible explanation lies in the theories of Otto Rank as seen in Rank (1989). Rank's theories posit that a measure of uniqueness is vital to being optimally creative. After learning a specific frame of reference, the artist should reflect on themselves and shift to a new frame of reference, or "unlearn" the old one. This process of shifting perspectives grants the artist the uniqueness (which assumed a strong self-focus) required to maximize creativity, and it may be an explanation for why the self-relevance condition caused higher creativity ratings in the loneliness condition.

The Effectiveness of the Manipulations

The analyses performed on the manipulations confirmed that the visualization manipulation worked; participants in the loneliness visualization condition reported

higher feelings of loneliness than those in the connectedness condition. In other words, participants felt lonely when they were expected to feel lonely. Visualization has been established over many studies as a valid manipulator of emotions, so the effectiveness of the manipulation in this study may not be surprising. The group relevance manipulation did not have any effect on a participant's donation target recall (self versus group), suggesting a failure to manipulate group relevance.

The chi-squares conducted to confirm participants' recall of the conditions they were placed in revealed some interesting results. Participants in the loneliness visualization condition were more likely to report that they were in the "friends unavailable" condition than those in the connectedness condition. However, there was a lack of significance overall in the participants' recall of the group relevance condition. Loneliness made an impact as it should have, but why participants could not accurately recall the relevance condition they were in may merit further investigation.

Study Limitations

The most major limitation of this study is the possibility of poor construct validity for the independent variables and dependent variables. The complex manipulations of the independent variables might have had created confounding variables along with their intended independent variables, such as desire to help the group with the fundraising efforts, in the group relevance condition. Specifically, participants may have created their slogans with the aim of ensuring that they could help the organization they had selected, and so their creativity may have suffered due to trying to appeal to the potential judges.

Regarding the dependent variables, the coders themselves may have been a limitation. One coder was the researcher, the second coder was an undergraduate student, and the third coder was a lay person. This selection of coders might have resulted in different degrees of expertise. The coders were informed of what to look for in creative slogans (aspects such as wordplay, pop culture references, etc.) and also given the aforementioned definition of creativity ("unconventional uses of or ideas about an object or concept"), but there simply may not have been enough coders to make the dependent variables reliable. While only a few experts on a topic may be needed to achieve reliable dependent variable scores, it would take many more lay people's ratings to achieve the high construct validity and reliability of the dependent measure.

Another limitation of this study was the inclusion of "red herring" options in the visualization manipulation question. While "walk" response option (visualizing being on a walk) was largely ignored, many participants chose the "other" option, implying that the option may have distracted or confused them. There were no such "filler" options in the group relevance manipulation check question, which suggests that participants might have been unsure which target person/group they were asked to donate the money to.

Future Directions

Detecting the precise reasons for why the group relevance manipulation affected creativity in the direction it did would be a valid course of action for future studies. Perhaps an examination of a participant's fear of rejection may help in parsing the results. Examining self-centeredness may also prove to be a valid avenue for future research.

When attention is brought to the self, could that enhance creativity? Is there a self-serving impetus behind creativity? These questions merit investigation.

If a future version of this study were to use a similar theoretical and methodological paradigm, ensuring that the instigation of group relevance does not instill any helping behavior may increase the validity of the results. As mentioned above, the group relevance condition may have evoked a desire to help the group that resulted in attempts to appeal to the judges, and from there, lessened creativity. If helping weakened creativity, it would be advisable to remove the helping aspect from the study's conditions where possible.

Another potential avenue for future research would be to determine a method of manipulating connectedness and loneliness that does not instigate negative emotions. When strong negative emotions arise, people use emotion down-regulation strategies to cope with them. If no negative emotions are instilled, then the regulation strategies may not interfere. It can be seen that the loneliness manipulation of this study had effects on creativity (based on post-hoc analyses), but given that the overall interaction of visualization and slogan was not significant, those results should be regarded with caution. Future work should replicate those effects without instigating strong negative emotions. One suggestion would be setting a pleasant atmosphere in the visualized loneliness event without activating social cues, such as relaxing by oneself in a quiet space.

If this study were to be conducted again, some changes to its current paradigm may help strengthen its results. One possible change could be to alter the manipulation of

loneliness as mentioned above. Additionally, the theories of Otto Rank as mentioned earlier may provide a methodological solution for future forms of this study. One way to use his theories in a different form of this study would be to create a desire for participants to be unique in one condition and a desire for participants to embrace a group in another condition. The uniqueness condition could potentially replace the current loneliness condition and create a feeling of being "individual" without loneliness's strong negative emotional effects.

APPENDIX A

Visualization and Mood: Informed Consent

Visualization and Mood: Informed Consent

You are invited to participate in a study on visualization and its effects. This study is conducted by Samantha Miller, a graduate student, and Professor Anca Miron, both of the University of Wisconsin Oshkosh Psychology Department. We are studying the effects of visualization of events. This document is intended to help you decide whether or not you will participate in this study. Your participation is strictly voluntary and you may withdraw at any time without penalty. Any information you may provide will be recorded confidentially under a participant number.

During the study you will first perform a visualization task in which you will be asked to write about an event in your life. Then you will be asked to complete an idea generation task where you will make a slogan for a product to be sold at a fundraiser. While you may not directly benefit from participation in this study, the results will help increase understanding of visualization processes for researchers and others who would like to use the information.

If you choose not to participate in the study, let the researcher know and you will be excused. If you agree to participate but withdraw at a later point, you will still receive credit for the time spent in the study, and any information collected from you will be destroyed.

Once the study is completed, we would be glad to share the results with you. If you have any questions, you may contact:

Samantha Miller   **Dr. Anca Miron**
Psychology Department   **Psychology Department**
University of Wisconsin Oshkosh   **University of Wisconsin Oshkosh**
Milles04@uwosh.edu   **mirona@uwosh.edu**

If you have any complaints about your treatment as a participant in this study, please call or write:

Kelly Schill, IRB Administrator
Institutional Review Board
For Protection of Human Participants
c/o Grants Office
UW Oshkosh
Oshkosh, WI 54901
920-424-1415

I have received an explanation of the study and agree to participate. I understand that my participation in this study is strictly voluntary.

PRINTED NAME   SIGNATURE   DATE

APPENDIX B

Introduction

Introduction

This study is examining the effects of visualization of certain scenarios. Visualization can affect moods, and that property allows it to affect many other aspects of life, such as communication. In this study, we seek to explore visualization's ability to affect aspects of life in this manner.

This study is comprised of two tasks. The first one is a visualization task, where you will be asked to visualize a certain event in your life and write down what you see. The second task is a slogan generation task where you will have to create a slogan for a product you are selling as part of a fundraiser. Because the tasks are short, we put them in the same session, but they are unrelated to each other.

When you are finished reading these instructions, let the researcher know and you will receive a sheet with instructions for the first task.

APPENDIX C

Visualization Task (Loneliness Condition)

Visualization Task

Please **visualize** yourself on the first week of school. Imagine that you are a freshman that has just started school and has no friends at school yet, and you are by yourself in your room. Think about your thoughts and feelings in this situation, and then write down what you visualized below. You have 10 minutes for this task.

_____

_____

_____

_____

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APPENDIX D

Visualization Task (Connectedness)

Visualization Task

Please **visualize** yourself spending time with a close friend you like. Please use the friend's initials, if you would like. Think about your thoughts and feelings in this situation, and then write down what you visualized below. You have 10 minutes for this task.

_____

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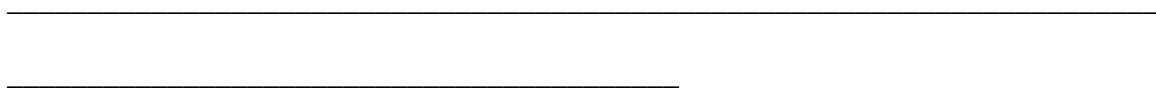
APPENDIX E

Mood Questionnaire

QUESTIONNAIRE
Reactions to Visualization

Directions: Please indicate by circling a number the extent to which you experienced each of the <u>feelings during your visualized experience</u>. Do not worry if you were not experiencing many of these feelings; only a few may apply to the situation. Please be sure to circle a response for each item.

	not at all			moderately			extremely
1. happy	1	2	3	4	5	6	7
2. connected	1	2	3	4	5	6	7
3. sad	1	2	3	4	5	6	7
4. lonely	1	2	3	4	5	6	7

5. guilty	1	2	3	4	5	6	7
6. anxious	1	2	3	4	5	6	7
7. rejected	1	2	3	4	5	6	7

8. moved	1	2	3	4	5	6	7
9. protected	1	2	3	4	5	6	7
10. relaxed	1	2	3	4	5	6	7
11. distressed	1	2	3	4	5	6	7

12. upset	1	2	3	4	5	6	7
13. disturbed	1	2	3	4	5	6	7
14. heavy-hearted	1	2	3	4	5	6	7

15. worried	1	2	3	4	5	6	7
16. concerned	1	2	3	4	5	6	7

17. sorrowful   1   2   3   4   5   6   7

18. joyous   1   2   3   4   5   6   7

APPENDIX F

Idea Generation Task (Self-Relevance)

Idea Generation Task

For this task, imagine that you are holding a fundraiser. You are selling baked goods. **Please devise a slogan for the snickerdoodle cookies you are selling and write it on the lines below**. You may use the rest of the paper to plan your slogans, but in the end, you must choose one slogan and write it on the lines so that it may be submitted as your official response. You will have 5 minutes for this task.

These are snickerdoodle cookies, made with cinnamon.

The professor in charge of the study, Dr. Anca Miron, will be evaluating all the slogans written by the student participants in this study, and the best slogan will win $25, awarded to the student who came up with that slogan.

FIRST, please write down how you are going to spend the money from the slogan task:

_____

NEXT, please write your chosen slogan below.

_____

_____

_____

APPENDIX F

Idea Generation Task (Group Relevance)

Idea Generation Task

For this task, imagine that you are holding a fundraiser. You are selling baked goods in order to **raise money. Please devise a slogan for the snickerdoodle cookies you are selling and write it on the lines below**. You may use the rest of the paper to plan your slogans, but in the end, you must choose one slogan and write it on the lines so that it may be submitted as your official response. You will have 5 minutes for this task.

These are snickerdoodle cookies, made with cinnamon.

The professor in charge of the study, Dr. Anca Miron, will be evaluating all the slogans written by the student participants in this study, and the best slogan will win $25, awarded to the student who came up with that slogan.

FIRST, please write down which school organization, if any, you would like to donate

the money won from the slogan task to: _____

NEXT, please write your chosen slogan below.

_____

_____

_____

APPENDIX H

Demographics Questionnaire

Demographics Questionnaire

1) What is your age? Please write a number in the space provided. _____

2) What is your gender?
____Male
____Female
____Other
____Prefer not to say

3) What is your ethnicity?
____White
____African-American
____Asian
____Hispanic
____Other

4) What is your major? _____
What is your minor? _____

5) What is your grade level?
_____Freshman
_____Sophomore
_____Junior
_____Senior

6) How many hours do you work per week? Write a number in the space provided:
_____

7) How many course credits are you taking this semester?

Write a number in the space provided: _____

8) What is your current semester GPA? _____

9) Do you remember which visualization task you received? Circle one.
Walk   Friends Unavailable   Supportive Friend   Other
10) Do you remember how you were going to spend the money from the fundraiser? Circle one.
On Yourself   Give to a School Organization
11) What student organizations do you belong to?

_____
_____
_____

12) Please indicate your agreement or disagreement with the following statements by using the scale below and by placing a number in front of each of the items:

     1   2   3   4   5   6   7

Strongly Disagree   Strongly Agree

_____I feel positively about my student group.

_____I value being a member of my student group.

_____I am proud to be a member of my student group.

_____Being a member of my student group gives me a good feeling.

_____I have a lot in common with other members of my student group.

_____I often think of myself in terms of my student group.

_____Being a member of my student group is a meaningful part of who I am.

_____Being a member of my student group is important to my sense of what kind of a person I am.

_____I identify with other member of my student group.

_____I feel strong ties with other members of my student group.

_____Overall, being a member of my student group has very little to do with how I feel about myself.

_____Being a member of my student group is an important reflection of who I am.

APPENDIX I

Debriefing Protocol

Appendix I.
Debriefing Protocol

Now that the study is complete, I would like to ask you a few questions about this study.

Have you participated in a psychology study before?   Yes   No

If so, what kind of study?

As you know, in some studies, participants are not told everything about a study until the study is over. Do you think that may be true about this study, that there is something more to it than what you have been told?   Yes   No

What do you think this study is about?

Why do you think that?

You were told that the purpose of this study was to examine the effects of visualization. **Did you believe that was the intent of the study?   Yes   No**

Did the visualization task affect your mood? Yes   No

If so, in what way?

As a part of the study, there were two tasks. Did you see a relationship between then?
Yes   No

The true purpose of this study is very different from the one I presented to you. This study is actually examining the effect of loneliness on creativity. The visualization task was intended to set you up with feelings of either loneliness or connectedness. The slogan task, meanwhile, was intended as the measure of your creativity after you experienced feelings of loneliness or connectedness.
There are three hypotheses being tested in this study. The first one is that participants will be more creative in a condition where they are giving to a group if they are made to feel lonely because they will want to engage with the group to reduce their loneliness. The third one is that participants who are made to feel connected to others will not be particularly creative in either conditions where they are giving to others or keeping for themselves due to feeling sufficiently connected to others, which removes the need to engage with a group and also reduces feelings of guilt from making themselves stand out. If you have any questions about this study, you may contact my Master's Thesis Advisor, Dr. Anca Miron, at mirona@uwosh.edu or 920-424-2328. The winner of the $25 will be

determined by a random drawing; if you are chosen, the professor will contact you by e-mail.

Thank you very much for participating in this study to the end. Before you go, I ask that you **please do not tell anyone else about this study** so that I may collect their true reactions if they sign up for this study as well.

Do you have any further questions about the study?

Once again, thank you for your participation.

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