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Psi Chi functions as a federation of chapters located at over 1,100 senior colleges and universities in the U.S., Canada, and Ireland. The Psi Chi Central Office is located in Chattanooga, Tennessee. A Board of Directors, composed of psychology faculty who are Psi Chi members and who are elected by the chapters, guides the affairs of the organization and sets policy with the approval of the chapters.

Psi Chi serves two major goals—one immediate and visibly rewarding to the individual member, the other slower and more difficult to accomplish, but offering greater rewards in the long run. The first of these is the Society's obligation to provide academic recognition to its inductees by the mere fact of membership. The second goal is the obligation of each of the Society's local chapters to nurture the spark of that accomplishment by offering a climate congenial to its creative development. For example, the chapters make active attempts to nourish and stimulate professional growth through programs designed to augment and enhance the regular curriculum and to provide practical experience and fellowship through affiliation with the chapter. In addition, the organization provides programs to help achieve these goals including regional and Society conventions, research award and grant competitions, certificate recognition programs, chapter awards, and Society service projects.

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The Role of Mood and Personality Type on Creativity

Paige D. Naylor, JongHan Kim, and Terry F. Pettijohn III*
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ABSTRACT. Research generally supports the view that positive mood results in higher creativity. The purpose of these two studies was to examine the effect of mood and personality type on creativity in problem solving. Mood was manipulated (positive versus negative) differently and personality type was measured (extravert versus introvert) consistently in both studies using a sample of undergraduate college men ($n = 16$) and women ($n = 57$). An interaction effect between mood and personality type was hypothesized. Extraverts in a positive mood were predicted to have higher creativity scores, but introverts in a negative mood were predicted to have higher creativity scores. Results supported the hypothesis. Extraverts in a positive mood had higher scores of creativity and introverts' scores were higher when in a negative mood for both Study 1 ($p = .02$) and Study 2 ($p = .01$). These results are useful in understanding how mood and personality can influence creativity.

Creativity in problem solving is a major area of study (Vosburg, 1998a). Every day people are faced with problems they must solve, and sometimes people have to be creative when they need to solve a problem (George & Zhou, 2002). It would be beneficial to know what factors influence creativity in problem solving. Two studies were conducted to investigate the factors that influence creativity. In both studies, mood and personality were examined as two potential creativity influences. The goal of these studies was to learn more about the interaction between mood, personality type, and creativity in problem solving. In both studies, creativity was measured by four divergent problem solving tasks. Divergent problem solving is a measure of fluency and creativity where participants are asked to come up with as many solutions or answers to a problem as possible (Vosburg, 1998a). For example, one divergent problem solving task given to participants is, "a classmate is constantly talking during an important lecture, and therefore you are unable to concentrate. What are all the different solutions

you can think of to solve this problem?" Showing that there are multiple answers to a problem, not just simply one solution, demonstrates creativity (Vosburg, 1998a).

Creativity itself may be affected by mood. Vosburg (1998b) tested the effects of positive and negative mood on divergent thinking performance. First, mood was assessed, and then participants went on to complete four real-life divergent tasks. Two of the tasks involved problem solving, where participants were to produce as many solutions to a problem as possible. The other two tasks tested problem finding, where participants were asked to come up with as many problems involved in the question as possible. The tasks were graded simply on ideational fluency, which is the number of items produced for each task. Results showed a significant positive relationship between positive mood and task performance, meaning participants had a higher fluency of responses to the task when they were in a positive mood. There was also a significant negative relationship between negative mood and task performance, meaning that participants in a

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negative mood had a lower fluency of responses to the task when they were in a negative mood. The researchers recommended replicating the study to involve actual mood induction to strengthen the validity (Vosburg, 1998b).

There is more to creative problem solving than just coming up with multiple solutions to a task. There is also the quality of the solutions. There are two main positions concerning mood and problem solving. The first is the general position: positive mood results in a positive relationship with creative problem solving across various tasks consistently. The second is the qualified position: the relationship of the general position is not always true; it varies according to the type of task. Sometimes positive mood simply produces a higher quantity of solutions, however not a higher number of quality ideas (Vosburg, 1998a). Vosburg (1998a) examined the difference between the two positions. Mood was assessed and then participants were asked to complete four divergent problem solving tasks. The first two problems were problem solving and problem finding (Okuda, Runco, & Berger, 1991). The last two were from Wallach and Kogan's (1965) battery of creativity tests where participants were asked to come up with as many uses for a shoe as possible, and to come up with as many representations for an ambiguous figure as possible. Vosburg (1998a) measured four factors. The first was ideational fluency, or the number of solutions. The second was ideational flexibility, or the number of different categories of solutions. These two are quantity measures. The next two are quality measures. One is originality and the next is usefulness, in other words functionality. Results showed a significant relationship between positive mood and the two quantity measures, fluency and flexibility, however not for the two quality measures, originality and usefulness. The results of this study support the qualified position that a positive mood does not always result in a positive relationship to creative problem solving (Vosburg, 1998a).

There are important characteristics to successful problem solving that include the quantity, the variety and utility, and the speed with which potential solutions are generated. Kaufman and Vosburg (2002) tested the effect of mood on early and late idea production. Early idea production, or coming up with the majority of solutions to a task early in the task, is least constrained by the solution. Late idea production, or coming up with the majority of solutions to a task later in the task, is most constrained by the solution. The hypothesis

was that people in positive moods would perform better with early idea production tasks and that people in negative moods would perform better with late idea production tasks.

Participants were divided into three groups: positive mood induction, negative mood induction, and a control group. Mood induction was achieved by showing participants clips of either positive or negative images. There were four tasks and participants had 4 min to work on each task. The first two tasks were real-life divergent thinking tasks, one of which was a problem solving task and the other a problem finding task. The second two tasks were again from Wallach and Kogan's (1965) battery of creativity tests. Results supported the hypothesis, showing that positive mood led to the best performance in the 1 min idea production. Participants in a positive mood were positively related to early idea production and negatively related to late idea production. This indicated that participants in a positive mood had better performance under the least constrained tasks, meaning participants in a positive mood performed better early on in the task when they knew that more time remained. Participants in a negative mood showed better performance on late idea production. This meant that participants in a negative mood performed best while under the most constrained tasks, later in the task when their time was almost up. The reasoning for the results is that people in a negative mood prefer to carefully consider all solutions to come up with the most qualitative solution because they are concerned with quality over quantity (Kaufmann & Vosburg, 2002).

Problem solving may occur in interaction with others and be influenced by these interactions (Brand & Opwis, 2007). For example, individuals who are extraverted prefer to work in groups, but individuals who are introverted prefer to work alone (Freyd, 1924). Brand and Opwis (2007) tested the effect of mood on problem solving to know if learning in dyads, meaning groups of two, affected performance. The researchers asked two questions. First, they wanted to know if positive mood impacted individual transfer performance after participants learned in dyads. Researchers wanted to see if a positive mood resulted in better transfer of learned materials than a negative mood. Second, researchers wanted to know how mood influenced transfer performance, and if mood made a difference in learning transfer tasks alone or in dyads. They conducted two experiments to test their hypotheses. They believed that positive

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mood would lead to better transfer performance regardless of dyad status. They also believed that pairs of individuals who previously worked in dyads would perform better than those who only had individual experience with learning the transfer tasks. All participants were paired into dyads, learned the transfer tasks, and were split into two manipulation groups with positive or negative moods. Then participants completed a problem solving task that required them to use the transfer task knowledge they had previously learned. Results showed that people with positive moods needed significantly fewer attempts to solve the tasks assigned. The second experiment tested whether working in dyads was more beneficial than working alone. This second experiment also tested the effect positive and negative mood had on participants' transferring of learned tasks. The participants were divided into two groups. Half of them were put into dyad groups, the other half worked individually to learn the transfer task knowledge. Then dyad groups were either in the positive or negative mood conditions as were the individual groups. Next all individuals were placed into dyad groups, and the previous dyad groups performed their problem solving task that required the learned transfer knowledge. Results showed that people who had first worked in dyads and were in positive moods performed the best. Individuals who first worked alone and were in a positive mood did the second best. Third best were people who first worked in dyads and were in a negative mood. Lastly were the individuals who first worked alone and were in negative moods. Mood had an effect on performance, regardless of whether the learning was being done individually or in pairs. Positive mood resulted in better performance in individuals and in dyads. Also, when participants learned in dyads they performed better in dyads. The current study examined mood and creativity in problem solving and problem finding. This was beneficial to examine because it showed that performance was better when individuals were in a positive mood, regardless of whether they were learning alone or in pairs. This study followed the same pattern as previous literature that was reviewed (Brand & Opwis, 2007).

Another relevant study had similar results. This study was comprised of four different experiments all yielding consistent results. Isen, Daubman, and Nowicki (1987) tested to see if positive affect resulted in higher creativity in problem solving. Since positive affect correlates with positive mood

this study was relevant to examine for the current studies. Throughout four experiments they found that positive affect consistently resulted in higher creativity in problem solving regardless of the type of mood manipulation or measure of creativity.

Previous studies have revealed that positive mood correlates positively with creativity. However, one study found results that show negative mood correlates positively with creativity (George & Zhou, 2002). George and Zhou (2002) examined the effect mood had on creativity in a workplace environment. They hypothesized that employees would be more creative when they were in a negative mood and less creative when they were in a positive mood if certain circumstances or conditions were present. The first condition was that the employees' creativity was valued and rewarded in the workplace. This is achieved usually by promotions and pay raises for employees who contribute to the workplace by using their creativity. Examples include an employee coming up with new solutions to problems, finding a better, more efficient way of doing something, and so on. The second condition was that the employee be aware of how they feel, which is referred to as clarity of feelings.

In order for mood to be a factor in how creative an employee is, the employee must be aware of how they feel and the mood in which they are experiencing. Individuals' moods determine how creative they will be in the workplace. Also the opportunity for rewards and recognition will have an effect on individuals' creativity. If an individual is in a negative mood they may try harder to come up with new and useful ideas because they are more critical of themselves. Negativity may also allow these individuals to see that there are potential improvements to problems. However, individuals in a positive mood are not as critical of themselves. Also because they are in positive moods they tend to see things around them more positively. They are not as active in seeing potential improvements for problems in the workplace because to them everything is already working fine. This study was conducted in a workplace setting where creativity was valued and necessary. Employees and their employers provided information to test the hypothesis that employees in negative moods were more creative than employees in positive moods when they felt their creativity would be rewarded and valued, and they were aware of how they felt. Results supported the hypothesis. Based on the employees and the employers' feedback about their employees, results indicated that the employees in

negative moods were more creative than those in positive moods when they felt valued and rewarded and aware of their feelings (George & Zhou, 2002).

It is clear that mood has a major impact on problem solving as evidenced by the literature reviewed above. However, is there some other factor that may interact with mood to effect problem solving? Personality type, such as whether an individual is an introvert or an extravert, may also be a factor that influences problem solving. Literature states that extraverts tend to perform better on cognitive tasks (Landa, Martos, & López-Zafra, 2010). Extraverts also rely on positive stimuli around them to keep them happy. Extraverts particularly seek to be happy when completing effortful tasks. However, introverts do not seek to be happy when trying to complete effortful tasks (Tamir, 2009).

Tamir (2009) completed a study to examine if individuals continually seek out happiness. The hypothesis was that an extravert would seek out happiness before an effortful task, such as giving a speech or taking a test. Introverts were predicted to not seek out happiness before an effortful task, such as giving a speech or taking a test. Results supported the hypothesis. Extraverts seek out happiness before an effortful task, and introverts do not (Tamir, 2009). The reasoning is that extraverts need to be happy when performing tasks and introverts prefer not to be happy when performing tasks. Therefore, it makes sense to assume that introverts in a negative mood will outperform introverts in a positive mood on problem solving tasks.

The Current Studies

Research has shown that positive mood is related to greater fluency in divergent problem solving and negative mood usually inhibits the number of solutions to a problem (Vosburg, 1998b). However, are there times when positive moods can hinder creativity and negative moods can enhance creativity? Does personality, specifically whether a person is an introvert or an extravert, interact with mood states to influence creativity? Research has shown that extraverts tend to outperform their introverted counterparts on cognitive tasks (Landa et al., 2010). However, with introverts not seeking to be happy when performing effortful tasks, while extraverts do prefer to be happy (Tamir, 2009), it would seem introverts may perform better in circumstances when they are in a negative mood. This leads to an interaction prediction: introverts will be more creative when they are in a negative mood and extraverts will be more creative when they are

in a positive mood.

Relevant literature reviewed mostly examines how mood affects problem solving. The current studies examined the relationship between mood and problem solving, and also the relationship between personality type and problem solving. Not much research has been conducted investigating the positive effects of having introverts in a negative mood to enhance creative problem solving (Landa et al., 2010). The current studies were designed to show how mood and personality interact to influence creativity in problem solving.

Study 1: A Pilot Test

Using previously established methods of inducing mood and measuring personality and creativity, a pilot test using a small sample of college students was designed to test the current interaction hypothesis. Extraverts induced into a positive mood were hypothesized to be more creative in problem solving than extraverts induced into a negative mood. However, it was also hypothesized that when introverts were induced into a negative mood, they would be more creative in problem solving than the introverts who were induced into a positive mood. It would seem that not relying on positive reinforcements would let introverts be more creative while in a negative mood (Tamir, 2009).

Method

Participants. The sample size of participants was determined by the professor who taught the research course in which the current study was performed. Participants consisted of eight introverts and eight extraverts (10 men, 6 women). Participants were enrolled in psychology courses at a public university in the southeastern United States and were given course research credit for participating. The median age of participants was 23. Information regarding age and ethnicity were not gathered from participants. All participants were treated according to American Psychological Association ethical guidelines (APA, 2002). IRB approval was obtained before collecting data for this study, and all participants signed informed consent forms.

Materials. In order to determine extraversion and introversion, the Ten Item Personality Inventory was used (TIPI; Gosling, Rentfrow, & Swann, 2003). Gosling et al. (2003) discussed the convergence of the TIPI with other personality measures, test-retest reliability, and content validity in past investigations. Questions 1 and 6 were the only

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questions considered for introversion and extraversion classification. Question 1 asked the participant to rate themselves on a Likert-type scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*) on how *extraverted, enthusiastic* participants described themselves. Question 6 had the participant rate how *reserved, quiet* they described themselves (Gosling et al., 2003). The rest of the personality questions were not necessary for determining introvert and extravert categories. The scores for the introvert and extravert questions were compared. If the participant scored higher on the introvert question, the participant was classified as an introvert. If the participant scored higher on the extravert question, the participant was classified as an extravert. If participants scored identically on the two questions, they were excluded from analyses. Two participants met this criterion. Generally, participants showed a strong difference between these personality areas. A demographic survey was also used to obtain information about participant age and sex.

In the current studies, positive mood was defined as “happiness;” an activating positive mood. Negative mood was defined as “sadness;” a deactivating type of negative mood. In order to manipulate mood, two slideshows were used. To induce a positive mood, a slideshow with 14 positive images, obtained from an Internet search, was shown. Examples of these images included peaceful landscapes, laughing children, and smiling faces. To induce a negative mood, a slide show of 14 negative images, obtained from an Internet search, was shown. Examples of these images included pictures of animal torture, starving children, and The Great Depression. Exposure to images was assumed to alter the mood of participants, but we did not include a manipulation check in this pilot test. Each image was shown for 5 s, making each slideshow last 70 s.

Four real-life divergent tasks were used from previous studies examining creativity (Kaufmann & Vosburg, 2002). The purpose of these tasks was to present each problem and have participants come up with as many responses as possible. The first problem was: “Your friend Rolf sits next to you in the classroom. Rolf likes to talk to you and often interrupts you when you are taking notes. Sometimes he distracts you so that you are missing important parts of lecture. What are you going to do? How are you going to solve this problem?” The second problem was: “Write down problems you consider important to your studies. You can mention problems related to the university-site,

professors, politics, other students, or whatever you can think of.” The third problem asked participants to “list as many possible uses for a shoe you can think of.” The fourth problem showed participants an ambiguous figure and asked them to “please list all the potential representations of this figure” (Kaufmann & Vosburg, 2002). A stopwatch was used to record the time for participants to complete the various problems.

Procedure. The experiment was conducted in a laboratory setting in individual sessions with the experimenter. Participants first completed an informed consent form. Next, participants completed the TIPI questionnaire (Gosling et al., 2003) and a demographic survey and turned it in to the experimenter. The next step was mood manipulation. Based on random assignment, the participant was either assigned to a negative or positive mood condition. For the negative mood condition, participants viewed the slideshow containing negative images. The positive mood participants viewed the slideshow that contained positive images. The last step in the experiment was to measure creativity in problem solving. The participant had 4 min per problem to come up with as many solutions to each of the problems as he or she could. When the participant finished the last problem, the experiment was complete. The participant was then debriefed and the real purpose of the study was revealed. During debriefing, participants were invited to contact the researcher to know the outcome of the study and were asked not to discuss the study with anyone else.

Results

The number of unique solutions to the four creativity tasks were combined to produce a single creativity score. In order to test the hypothesis that there was an interaction effect, a 2 (mood) x 2 (personality type) between subjects analysis of variance (ANOVA) test was conducted for overall creativity scores. A critical p value of .05 was used to determine statistical significance. The interaction effect between mood and personality type was statistically significant, $F(1, 14) = 6.95, p = .02, \eta_p^2 = .37$. The main effect for mood was not significant, $F(1, 14) = 2.11, p = .17, \eta_p^2 = .15$. The main effect for personality type was also not significant, $F(1, 14) = .53, p = .48, \eta_p^2 = .04$. See Figure 1 for results.

Discussion

The main goal of the current study was to find an interaction effect between the two independent

variables, mood and personality type. As stated above, results supported the hypothesis. When extraverts were in a positive mood they were more creative in problem solving. Extraverts in a negative mood were less creative in problem solving.

One of the major limitations of Study 1 was the small sample size. In addition, no mood manipulation check was employed. Therefore, Study 1 was conceptually replicated in Study 2 to strengthen the reliability of this current research. A different mood manipulation was used for Study 2, in order to determine if a different manipulation would yield similar results.

Study 2

The same interaction effect was predicted for Study 2 as in Study 1. Extraverts in a positive mood were expected to be more creative in problem solving than those in a negative mood. Introverts were expected to be more creative in a negative mood compared to those in a positive mood. In Study 1, there was no mood manipulation check. In Study 2, there was a mood manipulation check and its effectiveness was assessed. In Study 1, a slideshow of positive and negative images was used to manipulate mood. In Study 2, a writing prompt was used to achieve positive and negative mood manipulation. This different mood manipulation was used to examine if similar results would be achieved regardless of the type of mood manipulation. To address the low sample size concern from Study 1, a larger and more diverse sample was sought in Study 2 to provide sufficient power to detect significant differences.

Method

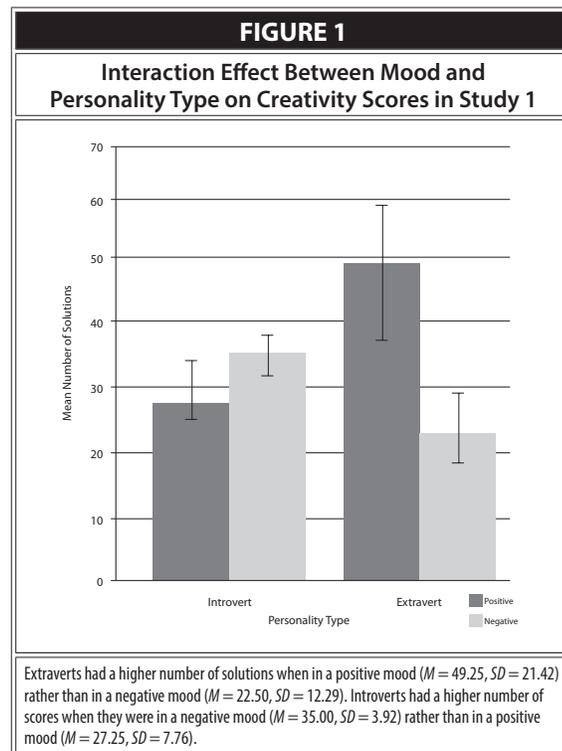
Participants. Participants were 57 undergraduate students (43 women, 14 men) from a public university in the southeastern United States. Participants were given course research credits for participating in the research, no additional compensation was provided. Of the 57 participants, 34 were categorized as extraverts and 23 were categorized as introverts. The mean age of participants was 22.50 ($SD = 6.16$). Forty-two participants were European American and 15 were African American. All participants were treated according to APA (2002) ethical guidelines.

Materials. The TIPI (Gosling et al., 2003) was again used to determine introversion and extraversion. The demographic survey had basic questions regarding participant race, age, and sex. Two writing prompts were used to manipulate

mood. These prompts were to write about the best (positive mood) or worst (negative mood) day of the participant's life for 4 min. The paper and directions were provided for the writing exercise. A mood manipulation check of two questions was also used. The participants responded to the questions on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The first question was, "I feel sad," and the second was "I feel happy."

The number of unique solutions to the same four problems were used in Study 2 as were used in Study 1 to measure the dependent variable, creativity in problem solving. A stopwatch was used to record the time for participants to complete the various problems.

Procedure. The same basic procedure was used in Study 2 as in Study 1. An experimental lab setting was used to conduct individual sessions. All participants provided informed consent prior to participation. Participants completed the TIPI questionnaire (Gosling et al., 2003) and the demographic survey before the mood manipulation. Based on random assignment, each participant was either assigned to a negative or positive mood induced condition. For the negative mood condition, participants ($n = 27$) were asked to write about one of the worst days of their life. For the positive mood condition, participants ($n = 30$) were asked to write about one of the best days of their life.



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Participants had 4 min to write about the prompt. A mood manipulation check was used to ensure the mood manipulation worked.

The last step in the experiment was to measure creativity in problem solving. The participant had 4 min per problem to come up with as many solutions as possible to each of the problems. Participants were timed with a stopwatch to see how long they took to respond to each problem. When the participant finished the last problem, the experiment was complete. The participant was then debriefed and asked not to discuss the study with anyone else.

Results

To determine if the mood manipulation was successful, a 2-tailed independent *t* test was conducted. The test showed that participants in the negative condition did indeed feel sadder than participants in the positive mood condition, $t(55) = 2.00$, $p = .05$, $d = .54$, $M_s = 2.30$ and 1.73 , $SD_s = 1.14$ and $.98$, respectively. Participants in the positive mood condition felt happier than participants in the negative mood condition, $t(55) = 2.59$, $p = .01$, $d = .68$, $M_s = 3.77$ and 3.19 , $SD_s = .82$ and $.88$, respectively.

Again, the number of unique solutions to the four creativity tasks were combined to yield a single creativity score. In order to test the hypothesis that there was an interaction effect, a 2 (mood) \times 2 (personality type) between subjects ANOVA was conducted for overall creativity scores. The interaction effect between mood and personality type was statistically significant, $F(1, 55) = 6.81$, $p = .01$, $\eta_p^2 = .11$. The main effect for mood was not significant, $F(1, 55) = .70$, $p = .41$, $\eta_p^2 = .01$. The main effect for personality type approached significance, $F(1, 55) = 3.37$, $p = .07$, $\eta_p^2 = .06$; extraverts reported more solutions than introverts. See Figure 2 for full results.

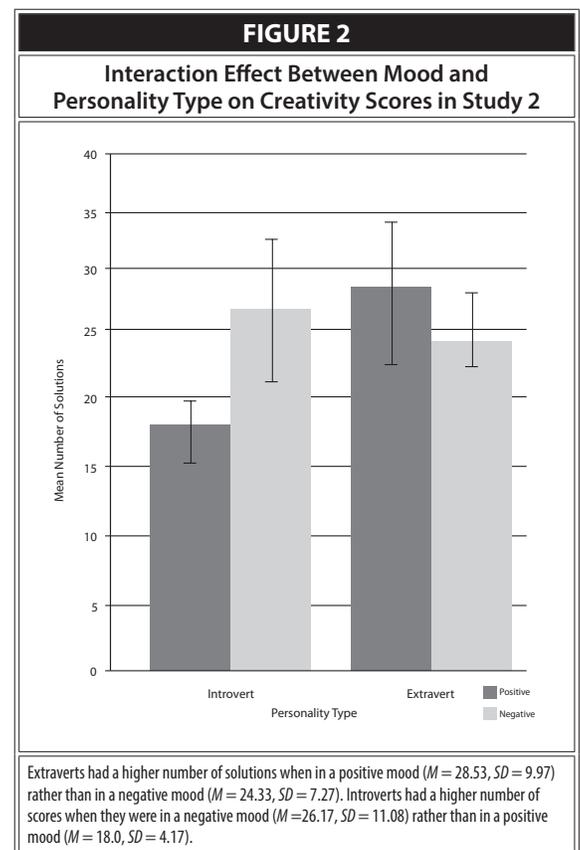
Discussion

The main hypothesis of Study 2 was the same as Study 1: an interaction effect between the two independent variables of mood and personality type. The results again support the hypothesis. Extraverts were more creative in a positive mood rather than in a negative mood and introverts were more creative in a negative mood rather than in a positive mood. Although there was not a main effect for mood, there was a marginally significant main effect for personality type. Overall, extraverts had higher creativity scores than introverts.

General Discussion

The main purpose of these two studies was to

examine if there was an interaction effect between the two independent variables of mood and personality type. This was supported by the results; when introverts were in a negative mood they scored higher on creativity in problem solving than when they were in a positive mood across two studies. When extraverts were in a positive mood they scored higher on creativity in problem solving than when they were in a negative mood across two studies. The fact that the same interaction effect was observed in both studies, even with different mood manipulations, is an important way to show these results are replicable. In Study 1, mood manipulation was accomplished by showing a slideshow, and in Study 2, it was accomplished by using writing prompts. In Study 1, the slideshow was shown and participants just watched and went on to complete the problems. However, in Study 2, participants were engaged in the mood manipulation by being asked to write for 4 min about a certain day in their lives. Then participants completed a mood manipulation check survey before continuing on to the problems. Regardless of how mood manipulation was accomplished, the results were consistent. However, we do note that the effect size when using the visual cues was greater than when



using the writing prompt. The writing prompt, although effective, may have produced greater variability in the strength of the mood manipulation because it was nonstandardized like the photo in the pilot test (i.e., everyone in the different mood conditions saw the same photos). Writing about one participant's worst or best day may not have elicited the same absolute emotion as writing about another participant's worst day. Despite this difference in effect size, the results of these two studies were statistically significant and show how mood and personality type interact to influence creativity.

Comparing the results of the current studies to previous studies (i.e., Vosburg, 1998a, 1998b), we do realize we did not find support for a main effect for mood in either of our experiments. Although we chose to focus on the interaction between mood and personality, perhaps previous samples have been comprised of a majority of extraverts who would exhibit greater creativity in a positive mood and lesser creativity in a negative mood. Depending on recruitment methods, and considering the possibility that college students and volunteers for studies may be more outgoing and sociable, this may be plausible. Further studies should be conducted to address this concern and identify when mood trumps personality in creativity outcomes. It should also be noted that the majority of the combined participants from Study 1 and Study 2 were women. Further studies could ensure a more equal sex participant ratio to see if results remain consistent.

The current studies could be strengthened by using a more thorough personality type inventory to determine extraversion and introversion, as opposed to measuring each with a single item. Time and budget concerns led to the adoption of the brief personality measure used in the current studies. Also, future studies could examine different types of positive and negative moods. In the current studies, positive mood was defined as "happiness;" an activating positive mood. Negative mood was defined as "sadness;" a deactivating type of negative mood. In future studies, it would be interesting to look at the different types of positive and negative moods. For positive mood, a deactivating type of positive mood would be "calm or relaxed." An activating type of negative mood would be "anger or fear" (Baas, De Dreu, & Nijstad, 2008). Expanding the subtypes of positive and negative moods would be interesting to examine. In addition to examining different types of moods, it would also be beneficial to measure the dependent

variable creativity in problem solving differently. An alternative measure of creativity insight is the Remote Associates Test (RAT; Mednick, 1962). The RAT presents three words that do not appear to have any relationship and asks what these items have in common. For example: golf, green, and beans, would be provided and the common element would be green (Baas, De Dreu, & Nijstad, 2011).

The new findings of this research are important because they add to the current literature. The new findings may help individuals understand how they may better influence their creativity in problem solving based on the condition of mood they experience. The new findings would benefit students participating in classes that have project assignments that allow for expression of creativity versus strictly traditional tests. Most professors incorporate "creativity" in their grading. Students with an extraverted personality may want to complete project assignments while in a positive mood, but students with an introverted personality may choose to complete their work in a negative mood to result in the most creative outcomes. The new research findings will help people in their efforts to better understand themselves and what makes them creative.

The current studies were successful in determining that personality and mood can influence creativity in problem solving. More specifically, mood and personality type influence creativity through an interaction. Personality type and mood must be taken into account together in order to influence creativity in problem solving. Extraverts will be more creative when in a positive mood than in a negative mood. Introverts will be more creative when in a negative mood than in a positive mood. The current study findings demonstrate the importance of both personality and mood *together* in determining creativity in problem solving.

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Spatial Attention in a Classroom is Influenced by Egocentric Thinking

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ABSTRACT. This study examined the effects of egocentric thinking on spatial attention within a classroom setting. Seventy-four undergraduates (52 women) of traditional college age were recruited through a research participation pool at a large university in Los Angeles, CA. Participants were randomly assigned to write for 3 min about the location of objects in the front of a classroom from either an egocentric (object-self relations) or an allocentric (object-object relations) perspective. Although more left-located objects were described overall, $F(1, 59) = 5.92, p = .018, \eta_p^2 = .09$, participants who wrote from an egocentric perspective described significantly more objects located to their left than right, $t(23) = 3.26, p = .003, d = 0.66$; whereas, those who wrote from an allocentric perspective described a statistically equal number of objects to both sides, $t(36) = 0.10, p = .922$. Our findings are consistent with previous work showing right-hemisphere dominance under the egocentric frame of reference and are the first to show that priming an egocentric perspective increases leftward attention in a naturalistic context of a classroom setting. Future research could examine the effects of frame of reference on spatial attention in other everyday contexts, such as driving or viewing internet content.

Whether we are parking a car, sitting in a classroom, or designing our bedroom, we are constantly analyzing and making sense of the position of objects—a process called spatial attention. There are two frames of reference that underlie spatial processing (Galati, Pelle, Berthoz, & Committeri, 2010; Zaehle et al., 2007). An egocentric frame of reference is viewer centered, whereby we judge the spatial position of objects in relation to ourselves; by contrast, an allocentric frame of reference is viewer independent, whereby we judge the spatial position of objects in relation to other objects (Galati et al., 2010; Zaehle et al., 2007). For example, a person using an egocentric frame of reference might describe the location of a tree in the park as “the tree is 12 feet away from me and to my left at about 10 o’clock,” whereas from an allocentric frame of reference, another might say, “the tree is 10 feet south of a redwood tree

and 5 feet east of a street lamp.” Although both descriptions are made from the viewer’s perspective, the egocentric description is self-referential.

Neuroscientific studies indicate that the egocentric and allocentric frames may be lateralized to more heavily involve either the left or right hemisphere (Abrahams, Pickering, Polkey, & Morris, 1997; Feigenbaum & Morris, 2004; Galati et al., 2000; Iachini, Ruggiero, Conson, & Trojano, 2009; Northoff et al., 2006; Vallar et al., 1999). The present study was the first to examine whether frame of reference would lead to greater lateralized spatial attention toward objects in an everyday context—in this case, while seated in a classroom.

Hemispheric Dominance and Spatial Attention

Due to the contralateral organization of the human visual system, the right hemisphere first processes objects and stimuli that appear to the left of our

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central viewpoint. Similarly, the left hemisphere first processes objects and stimuli located to the right of our central viewpoint (Hemond, Kanwisher, & Op de Beeck, 2007). The right hemisphere is more specialized for spatial attention, and thus, when its functionality is altered, spatial attention deficits are commonly seen (Silveri, Ciccarelli, & Cappa, 2011). One example is a condition known as visuospatial neglect that occurs in patients that have had cerebral lesions. For instance, Weintraub and Mesulam (1987) discovered that right, not left, hemisphere lesions disrupt spatial attention to the left. In a more recent study, Silveri et al. (2011) tested spatial attention in patients with various forms of degenerative brain pathologies and found that right parietal lesions were associated with neglect of stimuli located to their left.

Because of the specialization of the right hemisphere for spatial attention, when the right hemisphere is activated in a person with normal brain function, that person's attention will be directed towards the left visual field (Manly, Dobler, Dodds, & George, 2005). Smith and Trope (2006) conducted seven experiments in which a primed, powerful state increased global processing compared to a powerless state. In Experiments 1 to 6, they found that when individuals were made to feel powerful, they detected patterns, extracted the gist, rather than focusing on details, and categorized stimuli at a broader level. In Experiment 7, the researchers showed that the high power-priming task led to a leftward bias in spatial attention, as measured by a line bisection task, suggesting right hemisphere activation. Additionally, Nicholls, Loftus, Mayer, and Mattingley (2007) found that movement in the left (contralateral) hand activated the right hemisphere, shifting spatial attention to the left, and increasing collisions into the right side of a narrow doorframe that participants walked through. Furthermore, Manly et al. (2005) concluded that sleep deprivation counteracts the normal leftward spatial attention bias, shifting it rightward, as the activity of the right hemisphere is more connected to the arousal network (sympathetic nervous system). These three studies indicate that when the right hemisphere is activated, regardless of the stimulus, attention is directed to the left, and when it is less activated (i.e., sleep deprivation), attention shifts back towards the right.

Frame of Reference and Hemispheric Dominance

The majority of studies to date have found that

egocentric processing results in right hemisphere activation, specifically activation in the right parietal cortex, shifting the viewer's attention to the left (Northoff et al., 2006). Iachini et al. (2009) found that patients with right parietal lesions have an impaired ability to judge the distance of objects in relation to themselves (egocentrically). Furthermore, in persons with normal brain functioning, Galati et al. (2000) used fMRI to map frame of reference in the brain. Their participants were asked to describe the location of a visual stimulus in relation to either themselves, or in relation to another object. They found significant activation of the right parietal lobe when participants egocentrically judged the location of objects, but no significant lateralized brain activation occurred when participants allocentrically judged the location of objects.

Similarly, in another one of their studies using fMRI, Vallar et al. (1999) tested the effect of egocentric processing in seven healthy individuals who were instructed to press a button every time they perceived that a horizontally moving vertical bar passed the midsagittal plane of their body. Compared to the control group participants, who were told to press the button when the direction of the moving bar changed, and the allocentric participants, who were instructed to press the button when the moving bar passed the subjective midpoint of a horizontal line, the researchers detected more activation in the right hemisphere than the left under egocentric conditions. These studies suggest that the right hemisphere plays a critical role in egocentric processing, and therefore under egocentric conditions, a person's attention will likely be directed more towards the left. Further, there are clinical implications of these findings. Similar to the behavioral deficit of visuospatial neglect (Vallar et al., 1999), a lack of egocentric processing may be a symptom of right hemisphere damage.

However, not all studies have found an association between egocentric processing and right hemisphere activation. Previous studies have found an association, specifically, between the right parietal cortex and egocentric processing; however, it should be noted that some studies indicate that the right temporal lobe may be involved in allocentric processing, particularly with spatial memory (Abrahams et al., 1997; Feigenbaum & Morris, 2004).

Previous work on egocentric and allocentric frames of reference has focused on the extent to which these perspectives are lateralized to one

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hemisphere. In general, judgments about the distance of objects in relation to self (egocentric) have been associated with the right parietal cortex. These studies have not examined the link between right hemisphere activation due to egocentric thinking and spatial attention in the environment. Given that awareness likely shifts between egocentric and allocentric frame of references in everyday life, it is important to determine whether or not frame of reference directly influences the side to which we direct our spatial attention. Therefore, in the present study, we examined the effect of egocentric versus allocentric frames of reference on spatial attention in an everyday context.

In the present study, participants wrote about the location of objects within a classroom setting for 3 min under egocentric or allocentric instructions. Based on the studies presented above, showing right hemisphere activation during egocentric judgments about object location, we hypothesized that an interaction would occur between writing prompt and object location, with participants in the egocentric condition describing more objects located in the left than right sides of the classroom, and with participants in the allocentric condition not differing in the number of objects described in the left and right sides of the classroom.

Method

Participants

Seventy-four undergraduates (52 women) of traditional college age were recruited through a psychology research participation pool at a large university in Los Angeles, CA. This sample size was based on a target of at least 36 per group (72 total) as shown by Smith and Trope (2006) to yield statistically significant results on line bisection after a brief writing task. All participants were undergraduates who volunteered for extra course credit. The participants were randomly assigned to receive the egocentric or allocentric instruction. All provided informed consent prior to their participation.

Design

The present study used a 2 x 2 mixed design with the writing prompt (egocentric vs. allocentric framing) as a between-subjects variable and the side of the classroom in which described objects were located as a within-subjects variable.

Materials

The objects that the participants described were

located in an on-campus classroom. The classroom contained regular features including a projector screen and chalkboard in the center, long tables, a light switch, and a wall-mounted media panel. To increase the number of distinctive objects that participants could write about, we placed six objects in the front of the room prior to each session: lecture podium, a small green gift bag, a remote control, a small stool, a set of two textbooks, and a three-ring binder.

The six objects were clustered into two groupings of three, each placed on a table located at the left and right side of the front of the classroom. On one table, the podium rested with the gift bag on top of it and the remote control beside it. On the other table the stool was placed upside-down with two textbooks resting inside the legs and the three-ring binder leaning against the stool.

The writing task was administered on paper. The instructions intended to induce an egocentric versus allocentric frame of reference were printed at the top of an otherwise blank sheet of paper. The instructions for the egocentric condition were as follows:

Describe all of the objects in the room in terms of how they are positioned in relation to you. For each object you see, describe what it appears to be. Describe where it is in relation to where you are. Use words like left/right, above/below, closer/farther, and estimate actual distances as best you can. Be as specific as possible, so that if someone reads this, they could sketch out the things in the room you describe. The most important thing is that you think of yourself as the focal point in the room, so be sure to refer to your own location in relation to each object even if it feels repetitive.

The instructions for the allocentric condition were:

Describe all of the objects in the room in terms of how they are positioned in relation to each other. For each object you see, describe what it appears to be. Describe where it is in relation to the next thing you see. Use words like left/right, above/below, closer/farther, and estimate actual distances as best you can. Be as specific as possible, so that if someone reads this, they could sketch out the things in the room you describe. The most important thing is that you focus on the objects in

the room and ignore the people, including yourself, and your own location. Pretend you are viewing the room on tape and are not in it at all.

Both prompts concluded with an additional sentence: "Once the researcher says 'Go' you have 3 min, and try to keep writing the entire time." This writing task was novel in studying the effects of frame of reference; however, similar writing tasks have been found to induce states associated with lateralized activation (Smith & Trope, 2006).

Measures

Allocentric and egocentric writing prompts. We first scored the writing samples for adherence to the prompt, as this was critical for the manipulation to be effective. The first two authors independently read each writing sample, blind to experimental condition by removing the prompt from the top. The procedure was to count how many references to objects were egocentric versus allocentric, and compute the percentage of references that adhered to the instruction based on usage of the words *I*, *me*, and *myself* (all egocentric mentions associated with the self). Participants who did not adhere to the writing prompt on at least 20% of their references to objects were excluded from the analyses. This selection criterion of 20% was used in order to maximize the effect of writing prompt on frame of reference as well as to maximize the amount of participants that could be kept in the study. As such, if participants were assigned to the egocentric frame of reference, but described more than 80% of the objects in relation to other objects (allocentric) or if participants were assigned to the allocentric frame of reference, but described more than 80% of the objects in relation to themselves (egocentric), they did not follow the directions and were excluded from the study. This resulted in 13 participants in the egocentric and no participants in the allocentric group being excluded, reducing the sample size to 24 in the egocentric group and maintaining 37 in the allocentric group. The selection criterion of 20% was lower than optimal but higher adherence rates dramatically lowered the sample size in the egocentric group.

Side. In reviewing the writing samples, references to the regular features of the classroom (e.g., eraser, projector screen, desks, chalkboard, walls) were often ambiguous. For example, if a participant mentioned a desk or chalkboard, it was impossible to know the side of the room to which they were referring. Therefore, the selected dependent

variable was the number of the six, placed objects referred to in the writing sample that were located on the left versus right side of the room. The first two authors counted the object references independently and blind to the participant's experimental condition. Participants used different terms to refer to objects (e.g., the green gift bag was referred to as a present or bag) but the six target objects were distinct from the classroom objects, and very few discrepancies in scores occurred, all of which were easily resolved through discussion.

Each participant had a score from 0 to 3 for the number of objects coded as *right* or *left*, permitting a within subjects comparison. For example, if two objects were mentioned that were on the right side of the room, and one object was mentioned that was on the left side of the room, the scoring would be: *right* = 2, *left* = 1.

Procedure

Participants were tested in group sessions ranging from five to eight, depending on the number who signed up for a session. A maximum of eight participants was determined by space limitations, namely, up to eight seats could be staggered in the central lane of the classroom with clear views of the entire front. The six objects were positioned within the classroom. Consistency was assured by referring to a photograph taken of the target layout. The location of the object groupings was switched between sessions so that they appeared in the left and right sides of the classroom for an equal number of participants. The two groupings were used to eliminate the need to run enough sessions to counterbalance the position of each object, for example, pairing the gift bag with every combination of two objects on each side of the room.

Upon arrival, participants were asked to sit in one of the centrally located chairs and then were given, face down, the prompt for the writing task. The prompts for the writing task were shuffled by hand prior to the session and distributed with a cover sheet so that the researcher did not know which task was distributed to a given participant. Upon the researcher's instruction, participants turned over the sheet of paper and were asked to read the instructions for the writing task. Any questions were answered privately at the participant's desk. They were encouraged to keep writing the entire 3 min as timed by the researcher. The entire study through debriefing lasted less than 10 min.

Results

To test the hypothesis that an egocentric frame of reference would lead to right hemisphere activation, and therefore more references to objects located to the participants' left, a 2 x 2 mixed factorial Analysis of Variance (ANOVA) was conducted with the writing prompt (egocentric vs. allocentric condition) as a between-subjects variable and left- versus right-side object location as a within-subjects variable. The analysis indicated a main effect of side with more objects described on the left ($M = 1.11$, $SD = 1.23$) than on the right ($M = 0.70$, $SD = 0.96$), $F(1, 59) = 5.92$, $p = .018$, $\eta_p^2 = .09$ and an interaction of side and writing prompt, $F(1, 59) = 5.32$, $p = .025$, $\eta_p^2 = .08$ (see Figure 1).

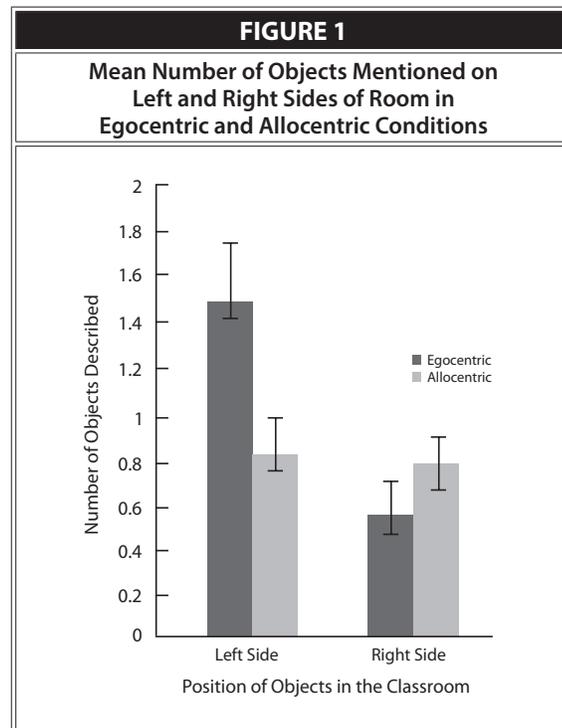
Independent samples t tests were used to examine simple effects of the writing prompt within each side of the room. Left-side objects were more often described by the egocentric ($M = 1.54$, $SD = 1.29$) than the allocentric ($M = 0.84$, $SD = 1.12$) group, $t(59) = 2.26$, $p = .027$, $d = 0.58$. However, the number of right-side objects did not differ between the egocentric ($M = 0.54$, $SD = 0.78$) and allocentric ($M = 0.81$, $SD = 1.05$) group, $t(59) = -1.08$, $p = .286$. A paired sample t test indicated that in the egocentric group, more objects were described to the left, than to the right side of the room, $t(23) = 3.26$, $p = .003$, $d = 0.66$. In the allocentric group, the number of objects described on the left and right sides of the room did not differ, $t(36) = 0.10$, $p = .922$. The test for the main effect of the writing prompt was not statistically significant, $F(1, 59) = 1.35$, $p = .25$, indicating the prompts did not elicit a difference in the total number of objects described.

Discussion

The purpose of this study was to determine how egocentric and allocentric frames of reference would affect spatial attention in the everyday context of a university classroom. Our hypothesis was that under egocentric conditions the right hemisphere would be more activated relative to the left hemisphere, and thus, a left spatial bias would be observed in egocentric but not allocentric conditions. This study provides support for our hypothesis in that the egocentric group wrote about significantly more left-located objects, whereas, in the allocentric group, the difference in the means was not significant, indicating that left- and right-located objects were described equally often. Our finding that more left-located objects were described overall (combining the two

writing prompts) is consistent with the large body of research showing a generally left spatial bias in people with normal brain function (Galati et al., 2000; Vallar et al., 1999). However, our finding that allocentric processing did not seem to significantly lateralize brain activation is consistent with some, but not all, research. Consistent with our results, previous fMRI studies show no significant activation of one hemisphere relative to the other in an allocentric frame of reference (Galati et al., 2000); however, in studies involving spatial memory, the right temporal lobe does show increased activity relative to the left hemisphere (Abrahams et al., 1997; Feigenbaum & Morris, 2004) suggesting that lateralization of the brain may occur to an extent during both egocentric and allocentric processing.

As the first known study to use an egocentric/allocentric writing task in an everyday context, we encountered a few limitations. First, we discovered that participants had trouble adhering to the egocentric writing prompt. Most in this group made a combination of egocentric and allocentric references, leading us to use fairly liberal selection criteria of at least 20% of object references being egocentric. Future studies using this type of writing prompt might benefit from placing greater emphasis in the instructions that each object should be described in relation to oneself. In addition, many references to objects were excluded from analyses



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due to the ambiguity of whether the reference was to a right- or left-sided object (e.g., wall, table). Our analysis involved only the six, conspicuous objects that we placed in the room. Because the side to which these objects were placed was counterbalanced, we do not expect that the particular objects influenced our findings between-groups, however, their oddity (e.g., upside down stool on a table) may detract from the everyday context of the classroom. We felt it was important to place an assortment of objects on tables to ensure visibility, but future studies could design a setting that features more naturalistic objects. In addition, although our sample size was not large, we had adequate power to test the hypothesis regarding writing prompt and side interaction. Lastly, the participants were fairly homogenous with regards to age (all were young adults), which may be a limitation to this study. Spatial attention may differ between older and younger individuals as the lateralization of spatial attention decreases with age, such that the elderly may not show right hemispheric dominance on spatial processing (Loibl, Beutling, Kaza, & Lotze, 2011). Therefore, in the elderly, it is possible that egocentric thinking would not increase leftward spatial attention, which remains a topic for future research.

Despite these limitations, the results of this study do have implications for spatial attention in various real-world contexts. This study is unique in that it focused on spatial attention within a learning environment, the everyday classroom. The results of this study indicate that students, when sitting in a classroom (an egocentric frame of reference), may focus more attention to material presented in their left visual field. Thus, future studies could explore if greater memory retention and/or enhanced learning occur when material is presented on the left side of the chalkboard, for instance, or left walls of the classroom. Understanding the correlation between spatial processing and learning could have a drastic effect on classroom dynamics and the methodologies and strategies employed by teachers to relate key information to their students. Presumably, individuals experience frequent variations in frame of reference, whether visually exploring the room they are in or moving through an environment. Our effect sizes indicated that 8% of the variance in object descriptions was accounted for by the interaction of side and writing prompt. This is a modest effect size (Kiehl & Green, 2010) representing a step towards understanding the effect of frame of reference on spatial attention

in a real-world context.

In addition, future studies could explore the state and situational factors that trigger shifts in frame of reference in everyday situations. Our findings suggest that if a person's awareness focuses on the position of that individual in relation to surrounding objects then greater spatial attention is directed toward the left. One situation where someone might judge distance from an object to the self is while maneuvering a car. In this situation, the person is most likely in an egocentric reference frame because he or she is looking at the objects in relation to his or her own position. It is possible then that, while thinking egocentrically, drivers would attend more to objects in their left visual field and pay less attention to those in their right. Such a finding would have implications for the placement of road signs to where they would be most noticeable by drivers. Finally, while viewing an advertisement, one may be in an egocentric reference frame as one thinks of how the advertisement, and therefore the product, could be useful for oneself. In this case it would be interesting to test whether or not a person attends more to the left side of the advertisement as the right hemisphere would be more activated.

In summary, egocentric thinking increased spatial attention toward the left in a classroom setting. This was the first study to demonstrate that cognitive priming of frame of reference can influence spatial attention in a real world setting. Future studies could make use of this brief, object-self relations writing task to manipulate frame of reference.

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The Impact of Music and Mood on Creative Thinking

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ABSTRACT. This study investigated the links among music, mood, and creative thinking. A total of 72 university students watched two video clips to induce certain moods (happy or sad) and then completed a divergent thinking task while listening to happy or sad music. Overall, there were 4 mood and music conditions. Two conditions were congruent (happy/happy or sad/sad), and the other two were incongruent (happy/sad or sad/happy). It was hypothesized that participants in the congruent conditions would show more creativity on the divergent thinking task, and participants in the incongruent conditions would show less creativity on the same task. There was a significant interaction between induced mood and music in the analysis of fluency of responses, $F(1, 64) = 5.15, p = .027, R^2 = .07$. When in a sad mood, people gave fewer responses if they listened to music that was incongruent with their mood. However, the fluency of responses of the people in the happy mood condition was not significantly affected by mood-music congruency. Overall, the findings implied that congruency affected creative ability especially for those people in a sad mood.

Creativity is an abstract concept that is generally defined as the ability to think unconventionally. The imagination that is often linked to creativity is evident through visual and dramatic art, music, and literature. Despite this common and narrow description, creativity also applies outside of the arts. Divergent thinking is one type of creativity that measures the ability to produce original ideas in response to an open-ended problem (Benedek, Könen, & Neubauer, 2012). There are no right or wrong answers. Beaty and Silvia (2012) described divergent thinking as “broad, diffuse, and bottom-up” (p. 310). In other words, people associate somewhat unrelated concepts and produce creative thoughts. In contrast, convergent thinking focuses on only one correct answer. Because divergent thinking and the broad concept of creativity may be affected by environmental factors, it is crucial to investigate studies that focus on the enhancement or inhibition of creative ability.

One factor that influences creativity is personal mood. Isen, Daubman, and Nowicki (1987) conducted a study in which participants completed tasks involving creative problem solving after a mood manipulation. The researchers found that participants in the positive-affect condition scored higher on the creativity tasks than those in the negative-affect condition. People in a happy or positive mood are more creative because such thinking requires an ability to identify similarities between concepts that seem unrelated (Isen et al., 1987). Similarly, Adaman and Blaney (1995) explored the possible link between mood and divergent thinking. The researchers hypothesized that happy moods would give rise to high scores on a divergent thinking task, but neutral and negative moods would not have a significant effect on the level of creative ability. They used music to manipulate mood to sad, happy, or neutral. Participants then completed the Unusual Uses Task from the Torrance Test of

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Creative Thinking, in which they provided applications for ordinary objects. The findings partially supported the original hypothesis because those in the happy condition scored higher on the creativity task than those in the neutral condition. However, those in the sad condition also scored higher on the task, leading to the conclusion that the heightened emotions of both happiness and sadness stimulated original thought.

One weakness of Adaman and Blaney's (1995) study was that it confounded mood and music. These researchers were interested in inducing certain moods and used music to do so. Because music prompted the mood changes, it is unclear whether the music or the mood was the factor responsible for producing significantly higher creativity scores. Not much research has been done regarding the sole impact of music on creativity, but past studies have examined the *Mozart effect*, the influence of music on general cognitive ability (Jones & Estell, 2007). Although this phenomenon is controversial (Pietschnig, Voracek, & Formann, 2010), the Mozart effect has been connected to enhanced spatial reasoning (Hetland, 2000). Therefore, a potential link could exist between music and creativity. The Mozart effect inspired the creation of the current study, and with this background information and the separation of variables, we should better understand which factor (either music or mood) could potentially affect creative ability.

One explanation for Adaman and Blaney's (1995) findings is that the mood and music interacted. Another study that displays the interaction between mood and music focused on the effects of sad or neutral music on memory and judgment (Vuoskoski & Eerola, 2012). That study found that participants recalled more sad adjectives after listening to self-selected sad music, although this depended on their emotional connection to the music. Furthermore, *affect-congruency* theory states that when people feel a certain emotion, they are more likely to rate stimuli as that same emotion (Hunter, Schellenberg, & Griffith, 2011). For example, when a person is sad, he or she may consider music that is playing to be sad. Music has the ability to induce emotions, especially when the listener is familiar with it.

Overall, Hunter et al. (2011) found an emotional congruency effect in their study of music and mood. After inducing a happy or neutral mood, the researchers had participants listen to either happy or sad music and complete a survey that addressed

their reactions. The results showed that people in a sad mood were more responsive to sad music than happy music as indicated in the survey. Similarly, those people in a happy mood responded positively to happy music. The researchers explained their findings through the idea of mood-congruency and the self-explanatory *misery-loves-company* hypothesis (Hunter et al., 2011), showing that the participants liked the music more when it matched their sad emotions. This observed mood-music congruency effect demonstrated how mood and music interact. Therefore, the congruence between the variables may be important with respect to creative ability.

There is a possibility that the combined effect of mood and music could influence creativity. Furthermore, this combined effect could be dependent on whether the particular conditions of these variables match. According to Adaman and Blaney (1995), happy or sad moods compared to neutral moods contributed to enhanced creativity. The congruency of mood and music in this study could have been the cause of the observed increase in creativity because there were no incongruent groups to use for comparison. Because Adaman and Blaney's study (1995) may have confounded the variables of mood and music, it is unknown whether the heightened levels of creativity were the result of mood, music, or the interaction between these two factors. We sought to investigate and resolve this confound by separating mood and music into two variables, initially manipulating mood, and then measuring creativity while music is playing simultaneously in the background.

The present study had two independent variables: mood (happy and sad) and music (happy and sad). We sought to induce the participants' moods to happy or sad by showing each person one of two video clips. After the mood manipulation, we utilized classical music that was congruent or incongruent with the currently induced moods. The music was played in the background while the participants completed a divergent thinking task. Based on the affect-congruency theory (Hunter et al., 2011), we hypothesized that people in the congruent mood and music conditions would obtain higher scores on the divergent thinking task than those people in incongruent mood and music conditions.

Method

Participants

A total of 72 undergraduate students from a small liberal arts college in Virginia participated in this

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IRB-approved study. All candidates had to be at least 18 years of age. Of the experimental conditions, there were 17 participants in the happy mood/happy music condition, 17 participants in the sad/sad condition, 20 participants in the happy/sad condition, and 18 participants in the sad/happy condition. Two participants' data were dropped from the sad mood/sad music condition because of a printing error, and another two participants from the happy mood/happy music condition were not included because they failed to complete the manipulation check. Once the data were discarded, there were 31 men and 37 women between the ages of 18 and 39 ($M = 18.99$, $SD = 2.67$). In terms of ethnicity/race, 73.5 % of the sample classified themselves as White, 7.4% were Black, 5.9% Hispanic, 5.9% Asian, and 7.4% Multiracial/Other. All of the participants were recruited from the General Psychology classes, and they signed up for the study through an online psychology database.

Design

The present study was a between subjects experimental design. The levels of the first independent variable, mood induction, were happy and sad. The levels of the second independent variable, mood of music, were happy and sad as well. As a result, there were four conditions: induced happy mood/happy music, induced sad mood/sad music, induced happy mood/sad music, and induced sad mood/happy music. The dependent variable was the fluency, or total number of responses given by the participant on a divergent thinking task (Benedek et al., 2012; Bonk, n.d.).

Materials

We used two video clips for the initial mood induction. One video clip, the fake orgasm scene from *When Harry Met Sally* (45 min, 53 s–47 min, 28 s) was operationally defined as happy (Scheinman & Reiner, 1989). This clip has been empirically validated to induce happiness (Gross & Levenson, 1995). The other video clip, the funeral scene from *My Girl* (81 min, 0 s–82 min, 23 s), was operationally defined as sad (Grazer & Zieff, 1991). The clip from *My Girl* was used to induce a sad mood because it was similar to the empirically validated clip from *The Champ* (Gross & Levenson, 1995). However, the scene from *My Girl* was more relevant to our sample demographics' generation. We ran a pilot study in order to validate the clip's effectiveness. After close examination, we found that the majority

of participants consistently gave higher ratings of sadness compared to any other emotion.

The operationally defined sad music was Tchaikovsky's Symphony No. 6 in B minor, Op. 74, "Pathetique" IV. Finale: Adagio lamentoso (10 min, 23 s) because of its minor mode and slow tempo. The operationally defined happy music was Tchaikovsky's Symphony No. 6 in B minor, Op. 74, "Pathetique" III. Allegro molto vivace (8 min, 42 s) because of its major mode and fast tempo (Tchaikovsky, 1893). These operational definitions were based on similar ones used by Hunter et al. (2011). Both pieces of music were accessed through naxos.com from the university library online database.

Mood or emotional states survey. The Mood or Emotional States survey functioned as a manipulation check after the mood-induction stage and consisted of four sections: questions about present moods, musical experience, musical preference, and demographic information. The first component was partially adapted from the Assessment of Emotion Measure (Lambert et al., 2010a), an internally reliable scale that had an alpha level of .87. In this measure, there were 25 different adjectives capturing happy, sad, angry, anxious, and neutral moods. Participants indicated how much they felt these emotions on a Likert scale ranging from 0 (*not at all*) to 5 (*very much*). However, due to the fact that we altered the scale slightly from the Assessment of Emotion Measure (Lambert et al., 2010a) in the current study, our redesigned survey had an alpha level of .17. Specifically, we reduced the list of adjectives to eight (*happy, tense, sad, content, nervous, bored, gloomy, and annoyed*) and focused only on the happy and sad emotions during data analysis. Also, we changed the Likert scale to range from 1 (*not at all*) to 5 (*very much*). These modifications may explain the discrepancy between the alpha levels of the original scale and our sample.

Divergent thinking task. Our divergent thinking task was modeled after Guilford's Alternative Uses Task (Benedek et al., 2012; Bonk, n.d.). This assessment has been used in conjunction with other similar divergent thinking tasks in a variety of studies (Chermahini, Hickendorff, & Hommel, 2012; Drapeau & DeBrule, 2013). It was intended to measure the participants' creative ability with respect to original thought. Specifically, our participants were asked to think of both conventional and unconventional uses for five provided objects: a brick, a cardboard box, a straw, a piece

of string, and a napkin.

Procedure

After volunteering to take part in the study, participants were randomly assigned to one of the four conditions: happy mood/happy music, sad/sad, happy/sad, or sad/happy. Before beginning the experiment, we ensured that everyone gave his or her informed consent. In a group setting dependent on their condition placement, participants then viewed a happy or sad video clip from *When Harry Met Sally* or *My Girl*, respectively. These clips were played at a medium volume and were viewed from a screen in the front of the classroom. While the participants watched the clip, the lights in the room were turned off, but the lights were restored after the clips finished playing. In order to confirm that the given clips actually influenced mood, the participants were then asked to complete the Mood or Emotional States survey individually (Lambert et al., 2010b). The participants took about five minutes to fill out the questionnaire.

Next, the participants individually completed a version of Guilford's Alternative Uses Task (Benedek et al., 2012; Bonk, n.d.) while listening to classical music for 11 min. This time was chosen because of the length of the musical selections. We wanted to make sure that all of the participants were exposed to the music for the entire testing time. Like the video clips, the music was regulated to a medium volume and remained so in all conditions. After the elapsed time, the papers were collected, and the participants were debriefed. All participants received credit in their psychology course for their involvement.

Results

To score the Mood or Emotional States survey, we subtracted each participant's self-reported sad rating from each happy rating. The resulting data produced a spectrum of emotion with a value of -4 being the *saddest* and 4 being the *happiest*. This scoring system indicated where each participant fell on the spectrum, rather than a classification as happy or sad. In order to check the validity of the mood manipulation, we conducted a one-way between subjects ANOVA with the independent variable of expected induced mood (happy or sad) and the dependent variable of self-reported mood rating. The difference between groups was significant, $F(1, 66) = 63.84, p = .001, R^2 = .49$. Using the aforementioned spectrum ranging from sad to happy, we concluded that the people

in the induced sad mood were sadder ($M = -0.94, SD = 2.37$), and the people in the induced happy mood were happier ($M = 2.57, SD = 1.04$).

Mean fluency was analyzed using a 2 (mood) \times 2 (music) between subjects ANOVA. Fluency was defined as the total number of responses given. The means and standard deviations for fluency scores are displayed in Table 1. The results revealed that the main effect of mood induction was not significant, $F(1, 64) = 1.90, p = .173, R^2 = .03$, implying that mood induction alone had no significant effect on the fluency scores. The main effect of the mood of music was also not significant, $F(1, 64) = .51, p = .477, R^2 = .01$. The mood of the music alone had no significant effect on the fluency scores. However, there was a significant interaction between induced mood and mood of music, $F(1, 64) = 5.15, p = .027, R^2 = .07$. In other words, creativity was influenced by both mood and music.

To follow up on the significant interaction for fluency, we conducted two simple effects to determine which of the four groups gave significantly more responses than the others. While the pattern of means (see Table 1) suggests that the congruent conditions demonstrated the highest fluency followed by the incongruent conditions, an analysis of simple effects revealed that this conclusion is not completely accurate. A simple effect of fluency for people in the induced happy mood group was not significant. In either the congruent or incongruent condition, happy participants did not give significantly more or fewer responses on the task, $F(1, 64) = 1.26, p > .05, R^2 = .02$. However, a simple effect of fluency for people in the induced sad mood was significant, $F(1, 64) = 4.34, p < .05, R^2 = .06$. Specifically, people in the induced sad mood gave significantly more responses on the divergent thinking task when they listened to sad music ($M = 25.27, SD = 11.00$) than when they listened to happy music ($M = 18.67, SD = 7.66$).

Discussion

The goal of this study was to determine whether mood, music, or an interaction between these two

TABLE 1

Means (SD) for the Fluency Scores on the Divergent Thinking Task

Mood of Music	Happy Mood		Sad Mood	
	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)
Happy Music	15	26.73 (7.90)	18	18.67 (7.66)
Sad Music	20	23.30 (9.39)	15	25.27 (11.00)

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variables had an impact on creativity. Participants viewed clips to induce happiness or sadness and then completed a divergent thinking task while listening to either happy or sad music. Because the video clips induced certain moods, a manipulation check was needed to make sure that the participants were actually happy or sad. The results from the mood questionnaire indicated that the manipulation of mood was successful. In general, people who were shown a happy video clip were happy, and people who were exposed to a sad video clip were relatively sad. We originally hypothesized that the participants in the congruent happy and sad conditions would exhibit higher levels of divergent thinking as opposed to those people in the incongruent conditions. This prediction was only partially supported. People in the congruent conditions gave more responses on the divergent thinking task, and those in the incongruent sad mood condition gave fewer responses. The finding of high fluency in the happy music/sad mood group was not expected.

The current study helped to clarify why Adaman and Blaney (1995) found that those in either an induced sad or happy mood scored higher on a creativity task than those in a neutral mood. Their study involved mood manipulation and utilized music to induce mood, so it is unclear what actually influenced the change in disposition. The researchers confounded mood and music, so the present study involved the separation of the two variables. To do this, we used video clips to alter mood and made music a secondary variable that was used to investigate the impact of congruence. From these changes, researchers might now understand more directly the influences of creative thinking. Taking the results of the current study into consideration, it is possible that Adaman and Blaney's (1995) results were due to an unintentional interaction between mood and music rather than just a straightforward mood induction.

These findings are consistent with the literature on mood congruency in that there was a significant interaction between mood induction and music for the fluency component (Adaman & Blaney, 1995; Hunter et al., 2011). Specifically, participants in the induced sad mood condition who then listened to happy music had significantly lower fluency scores than the other three conditions, whose fluency scores were not significantly different. Therefore, this finding suggests that congruence between mood and music was extremely important in terms of the total

number of responses. Even more so, this result is supportive of the theory of mood-congruency, which emphasizes the importance of congruent mood and stimuli. The effect is especially prominent when people are in a sad mood, as those in a sad mood show a preference for sad music, and those in a happy mood do not show a preference for happy, sad, or neutral music (Hunter et al., 2011). The results suggest that people in the induced sad mood may have manifested their emotional connection to sad music through their strong performance on the divergent thinking task. On the other hand, those people in the induced happy mood showed no significant difference in the fluency of their responses, so happier moods do not necessarily coincide with greater emotional investment.

One drawback of the current study is the deliberate exclusion of a third level of neutral mood and music for the sake of convenience. Adaman and Blaney (1995) used a neutral condition as a baseline to compare the happy and sad conditions. This inclusion necessitated the addition of three more conditions: neutral mood/neutral music, neutral mood/happy music, and neutral mood/sad music. If we were to include this additional level, we would need to incorporate these three extra groups in order to maintain consistency. Because our study was conducted as part of a semester-long project, these extra conditions would have complicated our research and required more time and a larger sample size. Also, we found it difficult to define neutrality because the term is considered highly subjective. A neutral video clip would have no elements that would make a viewer happy or sad. A neutral piece of music would need to have neither a major nor minor mode and would not favor a fast or slow tempo. However, the inclusion of a control group with neutral conditions would have made it easier to distinguish between effects due to mood and/or music or effects due to individual error or bias. In general, a control group would have decreased the likelihood of overestimating the effects of a treatment.

For the divergent thinking task, people could use all four scoring components to interpret the data: fluency, originality, elaboration, and flexibility (Benedek et al., 2012; Bonk, n.d.). Originality refers to responses given by less than five percent of individuals. Elaboration is defined as the extent of explanation in a response, and flexibility is the amount of variability in a person's individual set of responses. Although we could analyze all

components using our data, it is difficult to do so because the participants' responses do not adequately address all four of the components of the divergent thinking task. The three additional constructs of originality, elaboration, and flexibility would provide a wider definition of divergent thinking and, in turn, enhance the findings.

It is not uncommon for strong emotions to evoke highly meaningful artistic work, as individuals may look for ways to channel their intense emotions (Adaman & Blaney, 1995). Although they are rarities, some exceptional authors, artists, and composers suffered from psychological conditions like bipolar disorder and depression, causing them to feel intense happiness or sadness. Kneller (1965) noted that creativity was historically viewed as a mark of mental instability, so the ability to think creatively may stem from various neuroses. Freud considered creative ability to be a cathartic response to inner turmoil (Kneller, 1965). Although there have been studies that have focused on creativity and/or divergent thinking, researchers have not yet looked at the combined effect of mood and music on creative ability without mixing the two variables. The significant results of the current study indicate the importance of congruence, especially for people in sad moods. Furthermore, this investigation has revealed that certain moods and types of music seem to inspire people to be more inventive in their thought processes. Because creativity is a necessary quality for professions in the arts and sciences, it is important to understand when a person is most or least creative. Many people listen to music for inspiration, and this study has shown that mood and music seem to influence the quality of creative thinking. When people need to channel their creative abilities, they should consider their moods and music.

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A Comparison of Women in Lesbian and Heterosexual Dual-Income Couples: Communication and Conflict

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ABSTRACT. In light of the current dual-income literature, we examined whether lesbians in dual-income relationships would experience (a) greater domestic communication, (b) greater social support from their partners, (c) less work-family conflict, and (d) less family-work conflict than heterosexual women in dual-income relationships. A sample of 132 heterosexual and 112 lesbian women completed a paper survey about domestic communication, social support, work-family conflict, and family-work conflict. Lesbian women in dual-income couples experienced greater domestic communication, $t(234) = 4.119, p < .021, d = 0.62$ and greater social support, $t(239) = 6.082, p = .001, d = 0.79$ than heterosexual women in dual-income couples. Our hypotheses involving work-family and family-work conflict were not supported. These findings could be relevant for therapists working with lesbian couples because they could emphasize possible strengths in their relationships.

Relatively little attention has been devoted to the study of lesbian and heterosexual dual-career women. The relationship satisfaction, well-being, and social support of heterosexual couples have been examined in detail (Geist & Gilbert, 1996; Quek & Knudson-Martin, 2006), and researchers have explored lesbian couples' issues in the context of lesbian and gay couples research (Kurdek, 2005). Few studies, however, have compared lesbian and heterosexual dual-career women on various relationship issues (Kurdek, 1993). Communication about domestic chores, social support within the partnership, and work-family and family-work conflict are prominent factors in the maintenance and health of relationships (Kurdek, 1993, 2008), regardless of orientation, and we examine them here.

Also important to consider is the current legal and cultural movement toward the legalization of same-sex marriage in the United States and around the world. A discussion of lesbian and heterosexual relationship issues is especially timely with the recent action by the United State Supreme Court,

in which the court declared California Marriage Protection Act (Proposition 8) unconstitutional. Proposition 8, which made same-sex marriage in California illegal, was proposed to and passed in the California state legislature in 2008. Another decision by the Supreme Court, a ruling on the Defense of Marriage Act (DOMA) in which Section 3 of DOMA was ruled unconstitutional, signaled changing tides in the legal discussion of same-sex marriage and related federal benefits. Additionally, several states have recently legalized same-sex marriages, and various countries are reexamining their laws surrounding civil unions and marriage. These recent social changes, along with the sizable presence of same-sex couples throughout the country, are further reasons that an examination of lesbian and heterosexual couples is necessary and timely.

Domestic Communication

A central issue that affects dual-career couples is the division of household labor, whether chores or childcare, between the partners (Kurdek, 1993; Patterson, Sutfin, & Fulcher, 2004). In heterosexual

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couples, division of household labor tends to fall predictably along lines of gender, with women completing the majority of household tasks (Patterson et al., 2004). This use of gender to determine division of labor is called segregation (Blair & Lichter, 1991).

Women are more likely to spend their time in the home, and men are more likely to spend their time in paid employment outside the home. What is especially interesting about this gender divide is that, according to Blair and Lichter (1991), the division of household labor tends to be determined by gender in highly educated couples, as well as those without children.

What does this division mean for relationship satisfaction among heterosexual couples? In a study by Ross, Mirowsky, and Huber (1983), the repetitiveness of household chores (i.e., washing dishes or ironing) was linked to heightened levels of depression in women. According to Bergen (1991), the persistence of women completing the greater part of chores within the home limits their ability to work productively outside the home, thus limiting their access to financial resources. This creates a dependence of the wife on the husband that decreases her sense of (real or imagined) power in the marriage; when one partner has less money, that partner in turn has less power. When power is equally dispersed in the relationship, the couple feels greater relationship satisfaction (Peplau, Padesky, & Hamilton, 1982).

Conversely, for lesbian women, household chores tend to be divided on the basis of equality rather than segregation (Peplau & Cochran, 1990). This means that both partners of lesbian couples feel they contribute equally to different types of work (i.e., washing dishes, paying bills, folding laundry). According to a study on segregation-, balance-, and equality-based division of household labor, lesbian women displayed higher levels of equality than heterosexual couples, and heterosexual couples displayed higher levels of segregation (Kurdek, 1993). This means that one of the two partners does the bulk of the household chores. In this study, the wife did the majority of the household work.

A construct associated with level of communication in the home is the partners' means of conflict resolution. More satisfied couples practice more positive conflict resolution, whereas less satisfied couples practice more negative means of conflict resolution (Metz, Rosser, & Strapko, 1994). Interestingly, lesbian couples reported engaging

in more positive conflict resolution strategies, maintaining a greater level of optimism about conflict resolution, and, in turn, reported greater relationship satisfaction than heterosexual women. Also, a greater level of emotional companionship exists in lesbian couples. In a study investigating differences between heterosexual and lesbian women on conflict and satisfaction in their relationships, lesbian women reported experiencing significantly less conflict and being significantly more satisfied in their relationships than heterosexual women (Meuwly, Davila, Nuñez, Garcia, & Bodenmann, 2013).

Additionally, Julien, Chartrand, Simard, Bouthiller, and Bégin (2003) studied positive communication in relation to conflict resolution and found positive communication during moments of conflict to be integral to the maintenance of the couples' relationship. According to Metz et al. (1994), lesbian women reported receiving more constructive assertive communication from their partners during moments of conflict, and they perceived less verbal aggression from their partners than heterosexual women did, possibly leading them to value a partnership in which they can communicate with their partners when conflict arises.

In recent qualitative work into lesbian couples' communication strategies, Connolly and Sicola (2005) found that lesbian women focus on communication that conveys meaning, put particular emphasis on negotiating skills in the relationship, and avoid derisive and condescending language. The authors also noted an increased focus on empathy between the partners, as well as an emphasis on reading body language and nonverbal cues.

Social Support

Current ideas about relationships acknowledge that relationships seem to develop in social contexts, and several studies have investigated the source of support for lesbian and gay relationships (Kurdek, 2004), as well as for heterosexual relationships (Goldberg & Smith, 2008). Does support for relationships seem to come primarily from family, friends, the partners themselves, or a combination?

In a study of gay and lesbian couples' social support, partner and friends were the most important people in each partner's social support network (Kurdek, 1988). In fact, friends made up 43% of support networks, whereas family members accounted for a mere 13.5% of total social support. Many of these couples had not disclosed their sexual orientation to their parents or family

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members for fear of a negative reaction. In a study investigating family support in same-sex couples, however, Rostosky et al., (2004) found that, when family support is available, it has a significant positive effect on the partners' perceived strength of their relationship.

In other related work, Connolly (2005) employed an ethnographic perspective to qualitatively examine coping strategies that lesbians employ in their relationships. The author identified two resilience themes that emerged in her interviews: relationship resiliency and couple resilience. The former focuses on interdependence and balance in the relationship, although the latter focuses on couple unification and buffering from external stressors. Both of these themes of resilience emphasize heightened support in lesbian partnerships.

These findings accentuating social support in same-sex relationships are notably distinct from heterosexual couples' support networks, in which family members make up a much larger share of the support (Julien et al., 2003). For both heterosexual women and lesbians, strong social support from the partner is important for overall perception of relationship quality.

Work-Family and Family-Work Conflict

Work-family and family-work conflict refer to the amount of conflict in family life because of work and the amount of conflict in work life because of family, respectively. When examining work-family and family-work conflict for heterosexual and lesbian dual-career couples, one *given* must be acknowledged. An accepted consistency in the work-family and family-work conflict literature is that each partner's career is influenced by the other partner's career (Rapoport & Rapoport, 1969). At some point during a long-term partnership, both couples will have to make decisions that will affect one or both of their careers. For heterosexual couples, this tends to mean that the wife's career will gradually become secondary to her husband's as time and childcare pressures mount (Kurdek, 1993). But for lesbian dual-career couples, very few norms exist as guides for how to handle career changes and work-family conflict (Hetherington & Orzek, 1989).

With little research into this area for lesbian dual-career couples, and with few real-life role models, these couples often are forced to forge a path for career decisions in the partnership that is not as clearly predictable as it might be for

heterosexual dual-career couples. There is the possibility, however, that this unforged path could result in a lessening of work-family and family-work conflict for these women because their paths can be more personal to their relationships and individual preferences.

Hypotheses

Given the existing research into lesbian and heterosexual dual-career women, we examine the following hypotheses in this study. First, we hypothesized that lesbians in dual-income couples would experience greater domestic communication than heterosexual women in dual-income couples. Second, lesbians in dual-income couples would feel more social support from their partners than heterosexual women in dual-income couples. Lastly, lesbians in dual-income couples would feel less work-family conflict and family-work conflict than heterosexual women in dual-income couples.

Method

Participants and Procedure

Three hundred fifty-three dual-income heterosexual women were approached to complete our survey; of those, 132 women returned a completed survey. This was a 37% response rate. Of the 128 dual-income lesbian couples who were approached to complete the survey, 56 couples, or 112 women, returned completed surveys. This was a 44% response rate. We surveyed women across 11 states: Georgia, Ohio, New Jersey, Louisiana, Florida, Indiana, Illinois, Texas, California, Alabama, and Washington. The majority of the surveys were returned from Georgia (86%).

Average age for heterosexual participants was 45.15 ($SD = 9.38$); average age for lesbian women was 37.14 ($SD = 9.75$). Heterosexual participants listed their racial background as being: 81.8% White, 14.4% Black, 1.5% American Indian, 1.5% Hispanic, and 0.8% "other." Lesbian participants listed their racial background as being: 79.5% White, 10.7% Black, 0.9% American Indian, 3.6% Hispanic, 3.6% Asian, and 1.8% "other."

To qualify to participate, heterosexual women had to be in a dual-income marriage in which both spouses worked more than part time. Lesbian women had to have been in a committed partnership for at least one year in which both partners worked more than part time. Couples were selected based on both convenience for the researchers and a snowball sampling technique. Participants were informed that their participation was completely

voluntary, and Institutional Review Board approval was obtained prior to any data collection.

Measures

Social support. To assess emotional social support, we asked the following questions: “My partner asks me regularly about my day”, “My partner is sympathetic when I am upset”, “When I am frustrated my partner listens to me”, “My partner accepts me completely”, “When I have a tough day, my partner tries to cheer me up”, and “My partner cares about me.” Items were rated on a scale ranging from 1 to 5, *strongly disagree* to *strongly agree*. Higher scores reflect greater social support from partner. The alpha coefficient for this scale was .85.

Work-family conflict. Work-family conflict and family-work conflict can be defined as the extent to which a person experiences pressures within one role that are incompatible with pressures from another role. To assess these constructs, we used Netemeyer, Boles, and McMurrian’s (1996) five-item Work-family Conflict Scale and five item Family-work Conflict Scale. An example item from the Work-family Conflict Scale reads, “The demands of my work interfere with my home and family life.” An example item from the Family-work Conflict Scale is “The demands of my family or spouse/partner interfere with work-related activities.” A Likert scale was used, with answers ranging from 1 to 5, *strongly disagree* to *strongly agree*. Higher scores indicate greater work-family conflict or family-work conflict. Netemeyer et al. (1996) found alpha coefficients of .88 to .89 for the Work-family Conflict Scale and .83 to .89 for the Family-work Conflict Scale. To provide evidence for the construct validity of their scales, Netemeyer et al. found negative correlations between work-family conflict and family-work conflict and organizational commitment and job satisfaction. They also found positive correlations with role conflict, job tension, role ambiguity, intention-to-leave an organization, and search-for-another-job. In this study, the alpha coefficient for Work-family was .93; alpha for family-work was .89.

Domestic communication. To assess wives’ sense of fairness, Hawkins, Marshall, and Allen (1998) developed the Orientation Toward Domestic Labor Questionnaire (ODL-Q). The subscale effective communication about domestic labor was used to assess fairness. The effective communication about domestic labor subscale has seven items; six were used in this study. An example item is “I feel appreciated by my partner for the

housework I do.” Items were rated on a scale from 1 to 4, from *not at all* to *very much like me*. Higher scores indicated greater communication about domestic labor. Hawkins et al. reported an alpha coefficient of .88 for the subscale. They provided evidence for construct validity by finding that those who felt appreciated and listened to also felt the division of housework to be fair. The alpha coefficient in this study was .89.

Results

Independent samples *t* tests revealed significance for two of our four hypotheses. Lesbian dual-income women ($M = 55.72$, $SD = 8.47$) experienced better domestic communication than heterosexual dual-income women ($M = 50.62$, $SD = 8.10$), $t(234) = 4.119$, $p = .05$, $d = 0.62$. Also, lesbian dual-career women ($M = 27.67$, $SD = 3.00$) experienced greater social support from their partners than heterosexual dual-career women ($M = 24.78$, $SD = 4.22$), $t(239) = 6.082$, $p = .001$, $d = 0.79$. There was not a significant difference between lesbian and heterosexual dual-career women on work-family conflict, $t(235) = .309$, $p = .168$, *ns*. Results for family-work conflict were insignificant as well, $t(235) = .006$, $p = .264$, *ns*.

Discussion

Our findings support two of the four hypotheses. Lesbian dual-income women experience better communication about domestic chores than their heterosexual counterparts do. Also, lesbian dual-income women experience greater social support from their partners compared to heterosexual dual-income women. These findings are theoretically consistent in that if lesbian couples receive less familial support than heterosexual couples, then they would be more likely to seek and receive support from their partners. Also, lesbian couples are more likely to focus on equality over segregation, which would require more communication to function effectively (Peplau & Cochran, 1990).

Surprisingly, our hypotheses that lesbian dual-income women would experience less family-work and work-family conflict were not supported. This seems theoretically inconsistent in that if lesbian women experience greater communication about domestic chores—one of the greatest sources of family-work and work-family conflict in the dual-income literature (Eldridge & Gilbert, 1990; Kurdek, 1993; Patterson et al., 2004)—then they would experience less conflict involving work and family.

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With homosexuality still widely unaccepted in families, it is not surprising that lesbian women are less likely than heterosexual women to turn to their families for social support (Kurdek, 2005). Conversely, research suggests that because lesbian women are likely to be alienated by families and friends for their sexual orientation, it is probable that lesbian women turn to their partners for the support that heterosexual women often receive from family and friends (Kurdek, 2005). Therefore, our finding that lesbian women receive greater social support from their partners is logically supported by previous findings.

Research by Peplau and Cochran (1990) suggests that heterosexual couples—regardless of education or childlessness—are more likely than lesbian couples to divide household labor on the basis of sex segregation. Women are likely to perform the bulk of traditionally female tasks, such as ironing, washing dishes, or cooking, whereas men are likely to perform the bulk of traditionally male tasks, such as mowing the lawn. Lesbian couples, on the other hand, do not have different sexes on which to base the division of household work, and are more likely to divide work on the basis of equality. Essentially, the focus is on how much and which type of labor each partner performs, so that both partners feel they are performing the same amount of the same tasks (i.e., one partner washes dishes tonight, and the other partner washes dishes tomorrow). Thus, it is consistent that lesbian couples would communicate more effectively about household work because they are not simply relying on sex to divvy up tasks.

As one of the first studies to examine both lesbian and heterosexual dual-career women on domestic communication, social support, work-family, and family-work conflict, we raise interesting implications. First, our insignificant results actually prove quite significant in the literature. We did not find significant differences between lesbian and heterosexual women on the work-family and family-work constructs, and this is surprising. Two major sources of conflict between work and family are household work and childcare (Kurdek, 1993; Patterson et al., 2004), and if lesbian women experience greater domestic communication, then it is logical to hypothesize that they experience less conflict involving these variables. It is possible, however, that there are sources of conflict between work and family that arise for lesbian dual-income couples that are currently neglected in the literature. Perhaps it is harder for lesbian couples to

secure daycare services that will work with same-sex parents, or perhaps lesbian couples' focus on equality over segregation in dividing chores backfires in that they spend an excessive amount of time discussing division of labor. This could easily increase conflict between work and family in that time is wasted divvying up work at home.

Another implication stems from our finding that lesbian dual-income women experience greater social support from their partners than their heterosexual counterparts do. Although the strength of support that lesbian women receive from their partners likely comes out of rejection by friends and family, their reliance on their partners for support could prove significant when examining happiness in relationships over time.

Our study is strong in several areas. First, it is one of few studies examining lesbian and heterosexual dual-income women in the same sample. Second, it serves to expand the relatively thin body of literature on lesbian dual-income couples. Third, our study was based on previously used scales with established reliability and validity.

A potential limitation to this study is that we used a paper survey. This forced participants to take the time to not only complete the survey, but also to mail it back to us. This could, however, be a positive method in that using a paper survey allowed us to match responses by couple.

Another potential limitation was that our data were self-reported, and there exists the possibility that participants' perceptions of their own experiences are different than their actual experiences. This, however, is theoretically consistent in that we were interested in lesbian and heterosexual women's perceptions of communication, support, and conflict.

A third limitation is that, because we surveyed couples, it was a challenge to ensure that we received responses from both members of each partnership. This is, however, an issue when surveying couples in general, and was not specific to our study. A limitation within this arena that is specific to our study, however, is that we collected two surveys per lesbian couple and only one survey from heterosexual couples. Although our focus was on women, thus requiring us to collect from both female partners in each lesbian couple, this could pose a problem when making comparisons between couples.

Our study points in several directions for possible future research. It would be interesting to assess differences in domestic communication for lesbian

couples with and without children. Perhaps once a lesbian couple has had children, the partners are more likely to abandon dedication to equality when it comes to household chores in favor of a method that is faster and more functional, such as a balance approach. Although these were not data we collected in this study, examining the possible mediating effect of children on communication is an important and relevant issue.

Another area for future research may be to assess the ways in which lesbian dual-income couples communicate about domestic issues. Do these couples spend a significant portion of time discussing what each partner accomplishes in terms of domestic chores, and could future research examine ways in which heterosexual couples might be able to incorporate this type of communication? It is likely that a substantial amount of direct communication about household work could prove beneficial for heterosexual dual-income couples, rather than just relying on a gender-defined division of labor.

It would also be interesting to further examine work-family and family-work conflict in lesbian and heterosexual dual-income couples. It was surprising to find insignificant differences on these constructs in our study, and although this could be attributed to our relatively small sample size, there could be other variables at work. Perhaps, as mentioned previously, lesbian dual-income couples experience stressors that increase their conflict between work and family, and these potential variables are important to address in future work.

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The Terror of Pregnancy: The Origin of Ambivalent Attitudes

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ABSTRACT. Research on Terror Management Theory (TMT; Goldenberg, Goplen, Cox, & Arndt, 2007) has offered an explanation for the negative views toward uniquely feminine physical features, as well as the ambivalence and prejudice displayed toward pregnant women. Participants read an essay on either creatureliness, uniqueness, or no essay, and then they completed inventories assessing negative attitudes toward corporal attributes. Attitudes toward semen and menstrual blood were found to be undifferentiated, $p = .95$. Next, in a modification of Goldenberg et al., participants rated the offensiveness of a photograph of a pregnant or nonpregnant model, as well as her competence level and whether the image evoked anger. Prior findings of increased offensiveness and lower competence evaluations of a pregnant female model, as a product of priming the similarities of humans and animals, were not replicated. Participants who did not read an essay displayed increased anger toward the pregnant model ($p = .04$, $\eta_p^2 = .07$), indicating that Ambivalent Sexism Theory may provide a strong conceptual framework for the explanation of ambivalent attitudes toward pregnant women.

“A period is just the beginning of a lifelong sentence.”
—Cathy Crimmins

Pregnant women are often viewed with ambivalence (Taylor & Langer, 1977; Walton et al., 1988). Although often engendering helping behavior from bystanders, they simultaneously face prejudice from the public for their new physique, as well as in the workplace (Corse, 1990; Cunningham & Macan, 2007; Halpert, Wilson, & Hickman, 1993). Barbie’s married friend Midge, a pregnant doll, together with a nude and pregnant Demi Moore on the cover of *Vanity Fair* magazine, caused public outcry. Walmart eventually pulled the pregnant doll from its shelves (Pregnant doll, 2002), and opaque wrapping covered the *Vanity Fair* issue. In the workplace, pregnant women have consistently been shown to suffer prejudice. They are often considered less competent, are less likely to receive

job offers, and are more likely to receive lower evaluations (Corse, 1990; Cunningham & Macan, 2007; Halpert et al., 1993).

Several theories attempt to explain the eschewal of the pregnant physique. The first is Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), an existential perspective focusing on a person’s fear of death. The second is Ambivalent Sexism Theory (AST; Glick & Fiske, 1996, 2001), a feminist theory that focuses on the objectification of women in light of long standing power inequities between men and women. Unlike traditional feminist theories, the objectification of women is only one of TMT’s facets, rather than its crux.

TMT posits that people’s conscious awareness of impending death is a continuous reminder that despite their advanced cognition, as all living creatures, they are nothing more than their physical bodies. The ensuing terror is controlled through

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the elevation of self-esteem, and adherence to cultural and religious beliefs that promise literal, or symbolic immortality. The feeling of control through immortality provides a psychological buffer, allowing people to believe that, unlike other animals, they are more than just their bodies. Therefore, anything that threatens that buffer by posing as a reminder that humans are glorified animals is shunned. As women have much in common with an animal lifestyle, including menstruation, pregnancy, and lactation, their association with these cycles arouses fear and disgust toward them. TMT claims that people quell their fear through the objectification of women. Although objectification reduces fear, as the woman is now an object rather than an animal, it has the ironic side effect of heightening prejudice toward her and the questioning of her competency and cognitive aptitude (Goldenberg, Heflick, Vaes, Motyl, & Greenberg, 2009).

A number of studies by TMT theorists support this point. Roberts, Goldenberg, Power, and Pyszczynski (2002) showed that female confederates who appeared to accidentally have a tampon, as opposed to a hairclip, fall out of their bags were socially and mentally devalued by participants of both sexes. Subjects physically distanced themselves from the confederate and rated her as less competent. Landau and colleagues (2006) found that men primed with mortality salience (MS) displayed decreased attraction when a woman was dressed provocatively, but not when she was dressed modestly. The findings were hypothesized to have occurred due to the threatening nature of animalistic sex in the face of mortality, versus the elevated idea of love as viewed through wholesomeness.

AST theorizes that the relational interdependence of men and women, in the face of inequitable allocation of power across genders, is the basis for both hostile and positive but patronizing attitudes toward women. By virtue of their reproductive and infant nourishment abilities, women were traditionally relegated to the home, while men seized the opportunity to run the world as they saw fit. This led society, almost worldwide, to develop as a patriarchy, in which men were the dominant gender. As men wish to keep this status quo of power, any female challengers are met with hostile sexism (HS). However, as men are dependent on women in the household, they reward domesticated women with a patronizing sexist attitude, known as benevolent sexism (BS; Glick & Fiske, 1996, 2001). Both types of sexism

are equally oppressive and an attempt to maintain the subordination of women and the disparity between sexes.

Cross-cultural research has found that the phenomenon of ambivalent sexism is not restricted to the United States, and its existence has been demonstrated in 18 other nations. Men across cultures embrace HS far more often than women, but women are more likely to endorse BS in countries in which men rate higher on a HS measure (Glick et al., 2000). The conceptual framework of Jost and Banaji's (1994) system-justification theory might provide an explanation for this phenomenon. As members of the subordinate group, the most rational way for women to justify their current inferior status is to embrace BS as the lesser evil of the two accepted commonplace ideologies. Although HS is viewed as a threat, BS, though a form of prejudice, may appear as a safe haven (Cikara, Lee, Fiske, & Glick, 2009).

Although TMT theorists appear to question the validity of feminist theories due to what they perceive as an incongruence of female self-objectification (Goldenberg et al., 2009), feminist theorists do not address the validity of TMT. Perhaps both are a cause in the corporal eschewal of feminine attributes of fertility. Goldenberg et al. (2007) demonstrated that participants who read an essay detailing the similarities between humans and animals were more likely to describe pregnant women as offensive and less competent, compared to those who read an essay outlining the uniqueness of humans compared to other creatures. However these findings may have resulted both from sexist attitudes as well as from fear of the animalistic properties of the body, as the authors themselves admit that reactions toward pregnancy are ambivalent. The prevalence of ambivalent feelings toward pregnancy, more so than other feminine fertility related cycles such as lactation and menstruation, may indicate the salience of the significance of the new life that pregnancy promises, more so than the animalistic physique, rendering TMT less of a factor in the objectification of pregnant women than in other situations.

"Everything in woman is a riddle, and everything in woman has one solution—that is pregnancy... You are going to women? Do not forget the whip!" (Friedrich Nietzsche, *On Little Old and Young Women*, 1954, p. 178–179)

The Present Research

TMT postulates that feminine bodily functions

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that women have in common with other animals, such as pregnancy, menstruation, and lactation, dehumanize them in the eyes of the men and women around them to compensate for the arousal of fear and disgust. A significant ramification is a perception of the woman's incompetence (e.g. Goldenberg et al., 2007, 2009; Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000; Roberts et al., 2002). According to this rationale, the objectification of pregnant women should not arouse anger, as anger is an emotion relegated for offenders who display control over the acts they have committed (Ellsworth, 1994); anger cannot be directed at harmless objects. AST, which emphasizes hostility toward women challenging socially acceptable gender norms, should predict anger toward pregnant women publically straying from the acceptable good mother model. Our present research investigates the role of anger within a previously established TMT experiment through the replication and adaptation of the work of Goldenberg et al. (2007).

An additional line of inquiry is the availability of TMT effects even in the absence of MS priming. To further real world generalization we incorporate a third condition to Goldenberg et al.'s (2007) design that included priming in the form of articles extolling the uniqueness of the human race and the similarities of humans and other animals, in which no essay is given to participants before exposing them to a photograph of a pregnant, or non pregnant model.

Contrary to the majority of TMT experiments conducted in the United States, with the work of Goldenberg et al. (2007) among them, in which participants are largely White American and occasionally Asian, or their ethnicity is not mentioned (e.g., Cox, Goldenberg, Arndt, & Pyszczynski, 2007; Grabe, Routledge, Cook, Andersen, & Arndt, 2005; Martin & Kamins, 2010), participants in the present research were predominantly Hispanic and African American. Although a meta-analysis of TMT research (Burke, Martens, & Faucher, 2010) previously hypothesized that culture plays an important role in participants' reactions to MS priming, it concentrated on research conducted around the globe, and not on responses of subcultures within the U.S. population. To our knowledge, no prior experiments have examined objectification in light of TMT, within subcultures within the larger U.S. population.

Finally, by investigating perceptions of semen versus those of menstrual blood, we remedy a

deficiency in current TMT research concerning research into uniquely male animalistic attributes. Previously uniquely feminine animalistic attributes, such as lactation (Cox et al. 2007), pregnancy (Goldenberg et al. 2007), and menstruation (Roberts et al. 2002) have been studied, as well as asexual animalistic attributes, such as defecation and sex (Cox, Goldenberg, Pyszczynski, & Weise, 2007; Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002). In one study (Roberts & MacLane, 2002) perceptions of male and female researchers who needed to either use a restroom, or to retrieve papers, were compared. Although only the women researchers stating a need to use the restroom were viewed more negatively than women who did not, here too the investigated attribute is not gender specific. To our knowledge, the effect of actual masculine animalistic attributes, such as semen, have yet to be investigated. TMT theorists hypothesize that a biological attribute uniquely male may engender stereotypical thoughts of strength and competence (Roberts et al., 2002), but this is an idea from within the traditionally feminist conceptual framework. Logically TMT should dictate that any animalistic corporal feature should be treated with the same objectification and disdain as a pregnant woman's abdomen, or a mother's lactating breast.

Method

Participants

The 118 participants (90 women, 25 men, and 3 individuals who did not specify) were all undergraduates at Lehman College who participated in the experiment in exchange for course credit in their General Psychology course. The sample was comprised of predominantly Hispanic (43%) and African American (26%) participants, and also included Asian American (8%), White American (6%), Biracial (4%), Caribbean (3%), and other (10%) participants. Participants' ages ranged from 16 to 59 ($M = 23.2$, $SD = 8.22$). The study was approved by the college's Institutional Review Board.

Materials

Essays. Participants read one of two essays: The creatureliness essay detailed similarities between humans and animals by including sentences such as: "The boundary between humans and animals is not as great as most people think ... We're all driven by needs for food, water, sex, and comfort ... Although some people like to claim that we humans

are vastly more intelligent than other animals, this doesn't really seem to be true." The uniqueness essay extolled the uniqueness of humans among living creatures, claiming: "Unlike animals, humans live in a world of ideas and concepts, morals and values... Although we certainly have some things in common with simple animals, we humans are truly special." Attached to each essay was the following instruction:

On the following page you will receive an essay randomly selected from a pool of essays written by honor students at the University of Tampa. Please read the essay at your own pace. At the end of the study there will be a couple of questions about the essay. The questions will be looking for your first natural gut impression of the essay. The following short essay was by a senior honors student at the University of Tampa. Students were asked to write on the topic: The most important things I have learned about human nature.

Corporal attributes. In an attempt to remedy the deficiency of TMT research into male-specific animalistic attributes, we created an 8-item inventory assessing attitudes toward semen, menstrual blood, and blood, which served as a control for the menstrual blood questionnaire. Using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) participants rated their opinions of the following statements: unflushed menstrual blood/blood/semen leaves me sick, releasing an extraordinarily large amount of menstrual blood/blood/semen is boast worthy, hearing people talk about menstrual blood/blood/semen would anger me, seeing menstrual blood/blood/semen in a movie would anger me, the bleeding/release of semen of humans and animals is similar, the sight of a blood soaked bandage/tampon/semen-filled condom would anger me, and wearing menstrual blood/blood/semen-stained pants should arouse shame.

Pregnancy manipulation. Participants received one version of a photograph from the *Sports Illustrated* swimsuit edition depicting a nude model, either pregnant or not pregnant, with a bikini painted on her. We created these photographs to eliminate extraneous variables. Goldenberg et al. (2007) used four different photographs: two photographs of a clothed Gwyneth Paltrow and two photographs of a nude Demi Moore. The photographs of Moore were both from *Vanity Fair* magazine: One was from August 1991 and showed

her nude and pregnant, covering herself with her hands. The other was from 1992 and showed her nude, not pregnant, and covered in body paint. The photographs of Paltrow, both pregnant and not pregnant, showed her clothed in a black dress. Although a pilot test was used to ascertain that both images were considered equally provocative, we preferred to keep all variables as constant as possible, because the difference between the photographs, especially those of Moore, is great. We opted to standardize by using one photograph and digitally manipulating it to appear pregnant. Using a photograph of an unknown model, rather than a famous celebrity, also allowed us to avoid the possibility of preconceived notions regarding the actresses affecting the outcome. Additionally Goldenberg et al. (2007) asked questions pertaining to the competence of Paltrow and the offensiveness of Moore. In an effort to further standardize the procedure, we choose to investigate both sets of questions on a single photograph. All participants received the same written instructions:

We are interested in people's reactions to images in the media. You have been randomly assigned one magazine image to review. Please examine it and then answer the questions that follow. You have been randomly assigned a picture of a (pregnant) nude model with body paint.

A 15-item questionnaire following the photograph served as the dependent measure. The first eight questions were taken from Goldenberg et al. (2007) and asked participants to rate the photograph on dimensions of offensiveness, pleasantness, disgust, beauty, and positive and negative tastefulness. Additionally, participants rated their reaction to the photograph in terms of favorableness, as well as disapproval. Items were rated on a 7-point scale (1 = *not at all*, 7 = *very much so*). The next three questions, also from Goldenberg et al. (2007), asked participants to rate, on a 7-point scale (1 = *not very*, 7 = *extremely*) whether they thought the model was intelligent, serious, and competent. To measure hostility as a product of sexism we added three questions intended to measure anger toward the depicted image. These items were rated on a 7-point scale (1 = *not at all*, 7 = *very much so*) and asked whether participants found the photograph to be angering, disrespecting, and irritating. Finally, participants were asked to report whether they believed modeling to be a feminine occupation.

Sexism measures. Next, participants completed

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Glick and Fiske's (1996) Ambivalent Sexism Inventory. Over the six experiments reported by Glick and Fiske, the alphas ranged from .83 to .92. This inventory consists of 22 items that measure both HS (alphas ranged from .80 to .92) and BS (alphas ranged from .73 to .85). An example of an item measuring HS is: "Women seek to gain power by getting control over men," and items such as: "A good woman should be set on a pedestal by her man" measure BS.

Demographic information. Lastly, participants reported demographic information including age, sex, race, and ethnicity.

Results

A one way analysis of variance (ANOVA) was conducted to compare negative attitudes to the gender-specific corporal attributes of semen, menstrual blood, and blood. Negativity means of all three attributes are presented in Figure 1 and the ANOVA was only marginally significant, $F(2, 114) = 2.85, p = .06, \eta^2 = .05$. Tukey HSD post hoc analysis revealed the main difference was between semen ($M = 3.87, SD = 0.83$) and blood ($M = 3.48, SD = 0.77$), $p = .07$. There was no difference between semen and menstrual blood ($M = 3.81, SD = 0.75$), $p = .95$, and only a trend for a difference between blood and menstrual blood, $p = .15$.

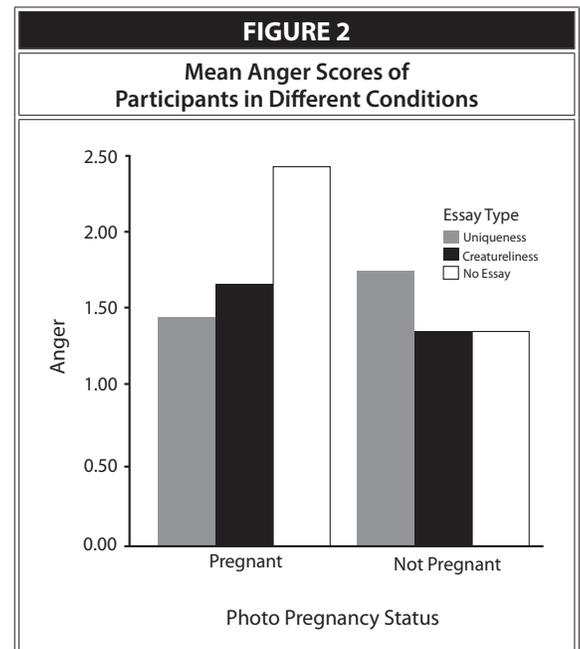
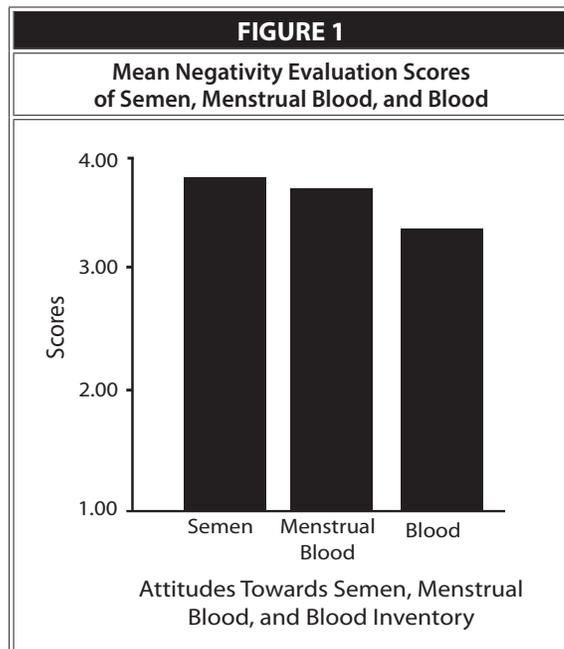
The corporal attributes survey was administered before participants rated the photographs, therefore completing it might have affected participants' offensiveness, competence, and anger

ratings of the photographs. To test this possibility and to evaluate participants' ratings of the images, 2 (pregnancy status) x 3 (essay type) x 3 (corporal attributes) ANOVAs were performed. A significant main effect was found only for the interaction of pregnancy status by essay type, and only for anger scores, $F(2, 115) = 3.42, p = .04, \eta_p^2 = .07$. Further analysis discovered that only within the no essay condition did the essay type have a significant impact on scores across the pregnancy status variable $t(34) = 2.40, p = .03, d = .80$. As illustrated in Figure 2, the pregnant photograph elicited greater anger ratings in the no essay condition ($M = 2.42, SD = 1.81$) as compared to the not pregnant photograph ($M = 1.35, SD = 0.58$). A one way ANOVA with posthoc testing within the pregnant condition revealed a significant difference between anger scores of participants in the uniqueness ($M = 1.45, SD = 0.73$) condition which were lower compared to the no essay ($M = 2.42, SD = 1.81$) condition, $F(2, 58) = 3.17, p = .05, \eta^2 = .10$.

Modeling was not considered a feminine occupation ($M = 2.34, SD = 1.86$). In addition, ASI scores ($M = 2.64, SD = .677, \alpha = .785$) did not significantly correlate with offensiveness, competence, or anger scores.

Discussion

In line with the TMT conceptual framework, we found that participants considered all corporal attributes equally negative regardless of gender, although the marginally significant difference was



observed due to a higher negative rating for semen. Perhaps the larger number of women among our participants explains this somewhat more negative view of semen. According to TMT, humans eschew all corporal attributes that are shared with other living creatures, and that are not uniquely human. Therefore, although TMT does not directly discuss perceptions of biologically unique male and female attributes, it should predict that female and male attributes will be perceived as equally offensive.

Our prediction and finding seemingly contradicts Roberts et al.'s (2002) musing within TMT that male attributes may "lead to negative perceptions of men and increased tendencies to view men in a stereotyped way, perhaps emphasizing their strength and competence." (p. 137). Although we believe the logic of TMT must dictate that both attributes should be rated with the same level of offensiveness, as both should elicit cognitions of humans' animalistic nature, our idea does not necessarily contradict that of Roberts et al. Although we found that all corporal attributes were perceived as equally negative, we did not measure the ramifications of these perceptions. Therefore we cannot rule out the possibility that a man's association with semen will heighten his perceived competence, although we find such a scenario unlikely, given our finding that semen is perceived negatively. Instead, it is possible that even though both gender's biological features are considered equally distasteful, men are still considered superior to women when associated with their unique attributes. Roberts et al.'s integration of feminist theories explains how this may be. Although both men and women have terror-arousing, gender-unique, animalistic features, the historical inequity of power due to women's maternal duties may predispose women to be viewed, as a whole, more negatively than men. To this, we add the idea that the sheer number of uniquely feminine characteristics (such as lactation, pregnancy, and menstruation) outweighs that of men (of which we can only think of semen), which may add to a more generally negative perception of women.

Theoretically, all corporal functions should elicit the same amounts of fear and disgust, rendering our findings of a slight but almost significant difference for attitudes toward regular blood, in which blood was considered the least offensive. Perhaps this discrepancy could be explained with the aid of the mere exposure effect (Zajonc, 1968). The mere exposure effect states that the more an organism is exposed to a stimulus, the greater the

stimulus' appeal will become. As blood is the most commonplace of the three functions, perhaps it elicits the least objection.

A shortcoming in our investigation is the examination of the negativity construct as a whole. Further research is needed to determine whether negative perceptions toward feminine and masculine attributes are equal across varying domains of negativity, such as shame, disgust, and anger, or whether different aspects of negativity are uniquely gender specific. Additionally, there are some key differences between semen and menstrual blood that could affect perception of them: menstruation causes discomfort, whereas ejaculation usually does not; the release of semen can be somewhat controlled; the duration menstruation is far longer than that of seminal ejaculation. We hope further research will continue to investigate the effect of gender specific biological attributes, to examine whether alternate attributes that are more equal across the board evoke similar patterns.

Attitudes toward pregnancy

We obtained a trend partially replicating the findings of Goldenberg et al. (2007), in which participants reading the creatureliness essay found the pregnant photograph more offensive than the nonpregnant photograph. However, we failed to find a difference between the uniqueness and creatureliness conditions when the model appeared pregnant, and most importantly we failed to find any significant results in our replications.

A number of viable alternatives may explain the discrepancy between the findings. One is that there has been a decrease in prejudice toward pregnant women over the past four years. We consider this alternative unlikely considering the finding that in absence of an essay, the condition most readily associated with real world findings, a significant interaction was found between pregnancy status and anger ratings. It is also possible that the difference in photographs in the two experiments contributed to the differences. However, as our photographs were identical with the exception of the pregnancy status, we believe that our results were valid. In regards to competence scores, we believe the fundamentally different nature of the photographs used in this experiment, where the model is nude, as compared to the clothed photograph provided in the original experiment, is a significant part of the explanation. However in an effort to standardize the procedure we believe it was necessary to examine all attitudes on the

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same photograph. Finally, our photograph was of a relatively unknown woman, rather than famous celebrities. Again, we feel this might make our results more valid because we were able to eliminate contamination from participants' positive or negative feelings about the celebrity portrayed.

Our posited answer is more complex, and it relates to the highly ambivalent nature of pregnancy. Although the pregnant physique may certainly cause a parallel to be drawn between the woman and the animalistic aspect of her current state, it also arouses a strong preoccupation with the unborn baby. As the first author recently experienced pregnancy for the second time, she can attest, although only anecdotally, to these popular sentiments across genders because she was congratulated several times for her wonderful news, was shared stories about babies, was inquired to her well-being from people who never asked before, and had her stomach physically touched by strangers. On the other hand, we know of no anecdotal tales concerning strangers asking to touch and examine nursing babies up close, or of women being congratulated by strangers for ample supplies of breast milk. We hypothesize that compared to women in other stages of their cycle, such as menstruation or lactation, in pregnant women the baby is more salient than the pregnant form, allocating pregnancy a special status so that TMT, which deals with fears of death, is not as applicable. While this postulation may explain why, although pregnant women were mostly the subject of physical assistance when accompanied by a friend or alone, but not in the presence of their husbands (Walton et al., 1988); this postulation is highly speculative and warrants further research.

We believe TMT to be a viable explanation for many phenomena in general. However, we think that perhaps AST provides a more relevant explanation in this situation, as indicated by the significant finding in the anger questionnaire. This idea fits with the findings of Hebl, King, Glick, Singletary, and Kazama (2007) that pregnant women are met with less hostility when applying for feminine jobs. As modeling was not judged to be feminine, a significant rating of anger, a measure of hostility, in the no essay condition, is not surprising. Our position would be strengthened if a correlation had been observed between anger scores to the pregnant photo and ASI scores (or even either BS or HS scores). However, no such correlations were observed.

We are not arguing with TMT's proposition

that humans devalue corporal attributes, such as pregnancy due to its association with animals. Within the pregnancy condition, we found that participants who read the uniqueness essay displayed lower levels of anger, suggesting that viewing humans as disparate from all other animals might reduce anger. Although TMT indicates that humankind shares a common primal fear that can be quelled through perceptions of superiority, it fails to paint a picture of what happens in daily life, for which the condition with no prime is the best indicator. Our only significant finding across pregnancy conditions was that of anger in the no-essay conditions. Given that anger is not an emotion displayed toward objects, we contend that, even though pregnant women flaunting themselves may arouse an existential fear, they are primarily viewed as agentic challengers of the existing, gender-inequitable system.

Additionally, a methodological shortcoming of our study was the exposure of participants to the corporal attributes of semen, blood, or menstrual blood prior to completing their evaluation of the photographs. It is possible that the inventories themselves served as a prime in addition to the essays. Future studies examining this topic should better control for this possibly confounding variable.

Finally, it is possible that our sample demographics affected the outcome as well. Compared to the original experiment, whose sample was predominantly Asian American and White American, our sample was largely Hispanic and African American. Perhaps ethnicity has an effect on the offensiveness and terror of pregnancy. We know of no prior TMT studies in which the majority of participants were non-White or non-Asian. Thus, we believe that the role of culture and ethnicity should be further examined in future TMT research. Unfortunately, given the small number of White American and Asian American participants in our sample, we could not analyze ethnic differences. Nonetheless, with the growth of diversification in America, it would be pertinent to examine substructures and their varying attitudes on a more regular basis; the investigation of cultural affiliations should not be exclusive to the realm of cultural psychology.

Conclusions

Previous research found highly ambiguous attitudes toward pregnant women and postulated TMT as an explanation for the objectification. The present study, using a nonstandard ethnic sample,

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failed to replicate these findings, but located a trend in their direction. We suggest that further investigation into cultural differences are needed within TMT in general, and we postulate that AST plays a significant role, due to the findings of increased anger in the no essay condition. We believe general attitudes toward pregnant women are mediated by the prospect of a newborn, and that theories of hostile and benevolent sexism are better at describing prejudice in this case. We do not reject TMT as a conceptual framework in general, and we believe our results on the semen and menstrual blood inventories support it. Our hope is that future research into the mediating effects of the prospect of a newborn will help shed light onto the etiology of prejudice concerning pregnant women.

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Julia Hartmann
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Steven Kohn
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David Kreiner
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Ethan McMahan
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Rob Mower
Angelo State University

Morell Mullins
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David Nalbone
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Susan O'Donnell
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Ed Palmer
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Valerie Perez
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David Saarnio
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Deborah Steckler
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Holly Tatum
Randolph College

Annette Taylor
University of San Diego

Christopher Terry
Elmira College

Mary Utley
Drury University

Scott VanderStoep
Hope College

Bart VanVoorhis
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James Vaughn
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Jeffrey Vittengl
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Diane Wille
Indiana University Southeast

Kathleen Willet
Winthrop University

William Woody
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Bill Wozniak
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Michelle Wright
Masaryk University

Karen Yanowitz
Arkansas State University

Evan Zucker
Loyola University

WINTER 2013

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PSI CHI AWARDS

Psi Chi sponsors a variety of award competitions each year. Listed below is a brief overview. For more information, please visit www.psichi.org/?page=awards

Name of Award	Description of Award	Submission Deadline	Who Can Apply?	Award Amount/Prize
Bandura Graduate Research Award	Awards the student submitting best overall empirical study; cosponsored by APS	February 1	• Graduate	• Travel expense to APS • Plaque • 3yr APS membership
Cousins Chapter Award	Presented to one chapter that best achieves Psi Chi's purpose	February 1	• Chapter	• One \$3,500 award • Travel to APA • Plaque
Newman Graduate Research Award	Awards the student submitting best overall empirical study; cosponsored by APA	February 1	• Graduate	• Travel expense to APA • Plaque • 3yr journal subscription
Kay Wilson Presidential Leadership Award	Awards one chapter president who demonstrates excellence in the leadership of the local chapter	April 1	• Chapter President (chapter nomination)	• One \$500 award • Travel to APA • Plaque
Psi Chi/Psi Beta Building Bonds Awards	Awards to recognize collaborative activity by a Psi Chi and Psi Beta chapter	June 1	• Chapter	• \$100 award • Plaque
Model Chapter Awards	All chapters meeting the five criteria will receive \$100	June 30	• Chapters	• \$100 each chapter
Diversity Article Awards	Awards for best articles published by student authors on diversity issues	July 1	• Graduate • Undergraduate	• Two \$300 awards
Regional Research Awards	Up to 78 awards presented for the best research papers submitted as Psi Chi posters for the regional conventions	Deadlines Vary, Fall/Winter	• Graduate • Undergraduate	• \$400 each (number varies)
Denmark Faculty Advisor Award	To one outstanding faculty advisor nominated by the chapter who best achieves Psi Chi's purposes	December 1	• Faculty Advisor (chapter nomination)	• Travel expense to APA • Plaque
Kay Wilson Officer Team Leadership Award	Awards the best chapter officer team for exceptional leadership as a group	December 8	• Chapter	• \$2,000 award (\$1,000 for chapter + \$1,000 for officers)
Regional Chapter Awards	Presented to one chapter in each of the six regions that best achieve Psi Chi's purpose	December 1	• Chapter	• Six \$500 awards • Plaque
Regional Faculty Advisor Awards	To six outstanding faculty advisors (one per region) who best achieve Psi Chi's purpose	December 1	• Faculty Advisor (chapter nomination)	• Six \$500 awards • Plaque
APA or APS Society Convention Research Awards	Up to 8 awards (4 grad, 4 undergrad) presented for the best research papers submitted for APA/APS conventions	December 1	• Graduate • Undergraduate	• \$500 graduate (number varies) • \$300 undergraduate (number varies)

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PSI CHI RESEARCH GRANTS

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Name of Grant	Description of Grant	Submission Deadline	Who Can Apply?	Award Amount/Prize
Graduate Assistantship Grants	Provides funding for teaching and research graduate assistantships during any academic semester	January 17	• Graduate	• Eight assistantships of \$3,000
Psi Chi/Psi Beta Collaboration Grants	Provides funds for a Psi Chi chapter and a Psi Beta chapter to collaborate on a shared activity	January 20 June 1	• Chapter	• Two \$500 grants
FBI NCAVC Internship Grants	Provides living expenses for a 14-week unpaid FBI NCAVC internship to conduct research	February 1 June 1	• Graduate • Undergraduate	• Two grants, up to \$7,000 each
APS Summer Research Grants	Provides opportunities to conduct research during the summer with sponsors who are APS sponsor members	March 1	• Undergraduate	• Six \$5,000 grants (\$3,500 student + \$1,500 sponsor)
CUR Summer Research Grants	Provides opportunities to conduct research during the summer with sponsors who are CUR members	March 1	• Undergraduate	• Two \$5,000 grants (\$3,500 student + \$1,500 sponsor)
SRCD Summer Research Grants	Provides opportunities to conduct research during the summer with sponsors who are SDRC members	March 1	• Undergraduate	• Two \$5,000 grants (\$3,500 student + \$1,500 sponsor)
Psi Chi Summer Research Grants	Provides opportunities to conduct research during the summer at nationally recognized research institutions	March 1	• Undergraduate	• Fourteen \$5,000 grants (\$3,500 student + \$1,500 sponsor)
Faculty Advisor Research Grants	Provides funding for the direct costs of a project to support faculty advisors' empirical research	June 1	• Faculty Advisor	• Twelve grants, up to \$2,000 each
STP Assessment Resource Grants	Supports projects to develop assessment tests, instruments, and processes for the APA Guidelines for the Undergraduate Psychology Major	June 1	• Psi Chi Faculty Members	• Three \$2,000 grants
APAGS Junior Scientist Fellowships	Provides funding for a 1st-year or 2nd-year graduate-level project	June 30	• Psi Chi Members • APAGS Members	• Four \$1,000 fellowships, (number varies)
Unrestricted Travel Grants	Funding to assist students with travel expenses to a convention not funded by Psi Chi Regional Travel Grants. Total grant money available is \$22,500	September 5 December 5 May 5	• Graduate • Undergraduate	• Up to \$1,500 each
Thelma Hunt Research Grants	Enables members to complete empirical research on a question directly related to Psi Chi	September 18	• Faculty • Graduate • Undergraduate	• One \$3,000 grant
SuperLab Research Grants	One award for conducting the best computer-based research	October 1	• Graduate • Undergraduate	• SuperLab software • Cedrus Response pad
Undergraduate Psychology Research Conference Grants	To support local/regional undergraduate psychology conferences. Total grant money available is \$15,000	October 1	• Sponsor(s) of local and regional conference	• Up to \$1,000 each (number varies) + Psi Chi banner
Regional Travel Grants	\$33,000 overall available to assist students with travel expenses to a regional convention	Deadlines Vary, Winter/Spring	• Graduate • Undergraduate	• Up to \$400 each (number varies)
Mamie Phipps Clark Research Grants	Enables members to conduct a research project focusing on ethnic minorities. Total grant money available is \$10,000	November 1	• Faculty • Graduate • Undergraduate	• Up to \$1,500 each (number varies)
Graduate Research Grants	To provide funds for graduate students to conduct a research project. Total grant money available is \$20,000	November 1 February 1	• Graduate	• Up to \$1,500 each (number varies)
Undergraduate Research Grants	Funding to defray the cost of conducting a research project. Total grant money available is \$30,000	November 1 February 1	• Undergraduate	• Up to \$1,500 each (number varies)

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Online Journal Submission Process

All Psi Chi undergraduates, graduates, and faculty* are invited to submit their research to the *Psi Chi Journal of Psychological Research* through the new web based manuscript submission, tracking, and peer review software solution. Better than email submissions used in the past, this software allows users to create personal accounts to make the submission process more efficient.

Four items are required for all submissions:

- 1) **Cover Letter**
Include primary author's education status, manuscript originality statement, IRB approval
- 2) **Sponsoring Statement**
Undergraduate first authors only
- 3) **Cover Page**
Author names, school affiliation, and any author note
- 4) **Masked Manuscript**
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Simply register an account, then click Submit Manuscript:

- 1) **Upload Files**
Files can be removed, replaced, or reorganized
- 2) **Enter Manuscript Information**
E.g., title, abstract, authors, keywords, etc.
- 3) **Review Manuscript Material**
Summary of all information/ files submitted
- 4) **Submit Manuscript**
Receive email confirmation

New software benefits:

- Allows users to track their manuscripts' progress
- Inserts multiple files including cover letters, manuscripts, and figures
- Permits users to prioritize files and coauthors
- Checks for mistakes in the submission process and points out any errors
- Streamlines the process for authors and reviewers

* Psi Chi member ID number required

Register an account: <http://pcj.msubmit.net/cgi-bin/main.plex>

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