What is Morality? The Effects of Emotions on Moral Decision Making

by

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This is to certify that the accompanying thesis by Shannon Elizabeth Kelly and Nicholas Thiha Win have been accepted in partial fulfillment of the requirements for graduation with Honors in Psychology.

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Abstract

The present study tested the effects of boredom, flow, and anxiety on a moral judgment task. Two competing theories predicted different relationships between emotional state and moral reasoning. The first hypothesis predicted that participants in the anxiety and flow conditions would choose significantly fewer utilitarian responses on moral-personal questions than those in the boredom condition. The second hypothesis predicted that participants in the anxiety and boredom conditions would choose significantly fewer utilitarian responses on moral-personal questions than those in the flow condition. Thirty-six Whitman College students were randomly assigned to one of the three conditions, played two 6-minute rounds of Tetris, and completed a survey which included manipulation checks and a moral judgment task. The results did not conclusively support either hypothesis. However, a significant effect of mood group on moral-personal questions was found, whereby participants in a positive mood state chose fewer utilitarian responses. Implications of the effect of emotional states on moral judgments are discussed.

Keywords: flow, anxiety, decision making, moral judgment, emotion

List of Illustrations

What is Morality? The Effects of Emotions on Moral Decision Making

Although moral reasoning has been viewed as a purely rational process in the past, recent research suggests that emotion plays an important role in making moral decisions (Greene et al., 2001). However, psychological research has not yet been able to adequately describe the specific role played by emotion. Humans are capable of experiencing many different emotions, each of which may have its own, unique effects on decision making. A recently discovered emotional state called "flow" may be of particular interest because it is considered to be a state in which a person operates optimally (Nakamura & Csikszentmihalyi, 2002).

Flow Theory

The concept of flow is closely tied to intrinsic motivation, in which an activity is rewarding for its own sake (Nakamura & Csikszentmihalyi, 2002). Intrinsic and extrinsic motivations constitute different reasons for completing activities. Extrinsic motivation involves the incentive to accomplish a task for the sake of some external good, such as monetary reward or freedom from punishment. On the other hand, if an individual is intrinsically motivated then he or she finds completing the task itself rewarding. Getzels and Csikszentmihalyi noticed for example, that while working on a piece, painters would find the act of painting so rewarding that they would sometimes persist working on the painting, ignoring basic needs such as food and sleep in order to finish the piece (Nakamura & Csikszentmihalyi, 2002). However, once the painting was completed, they quickly lost interest in it, indicating that it was the process of painting that motivated them rather than the final product.

Csikszentmihalyi further investigated the nature and conditions of enjoyment in an activity by focusing on play and games, where intrinsic rewards are prominent (Nakamura & Csikszentmihalyi, 2002). He interviewed those who seem to focus attention on enjoyment as the sole reason for pursuing various activities, such as chess players, rock climbers, and dancers. He also studied types of work where extrinsic rewards such as money affected participation. From these interviews, Nakamura & Csikszentmihalyi (2002) formed a theory of the characteristics of optimal experience, or "flow," and conditions under which it occurs. In a flow state, the individual experiences positive affect, a high level of concentration on the task, low self-consciousness, and a high sense of control. Some conditions conducive to flow include situations that challenge one's currently existing skills, and awareness that one is performing at a level appropriate to one's own capabilities. Flow is also enhanced by clear goals, accompanied by immediate feedback to follow up the potential progress being made. Implicit in these characteristics is the notion of interactionism: rather than focusing just on the person (such as intrinsic or extrinsic motivation), flow research has evolved by increasing its emphasis on the interaction, or relationship between a person and their environment.

An individual in flow functions in a state of "dynamic equilibrium" (Nakamura & Csikszentmihalyi, 2002, p. 90). A balance between perceived abilities and perceived challenge of the task is necessary to enter a state of flow and perform optimally. If challenges exceed skills, the task causes anxiety, while if skills begin to exceed challenges, the result is boredom. For example, if a soccer player with a high skill level repeatedly performs a soccer drill that is easy for him or her to accomplish, then he or she will experience boredom. At the other extreme, if a person with little experience in soccer

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attempts to perform a difficult soccer drill then he or she would experience anxiety. Both situations would be incompatible with flow.

Csikszentmihalyi illustrated this relationship by charting perceived skills and challenges on a graph (Nakamura & Csikszentmihalyi, 2002). This illustration consists of a two-dimensional space (defined by the dimensions of skills and challenges) within which three regions are defined: a flow channel region where challenges and skills are approximately proportional; a region of boredom, in which action capabilities outweighs action opportunities; and a region of anxiety, in which challenges exceed capacities for action (see Figure 1).
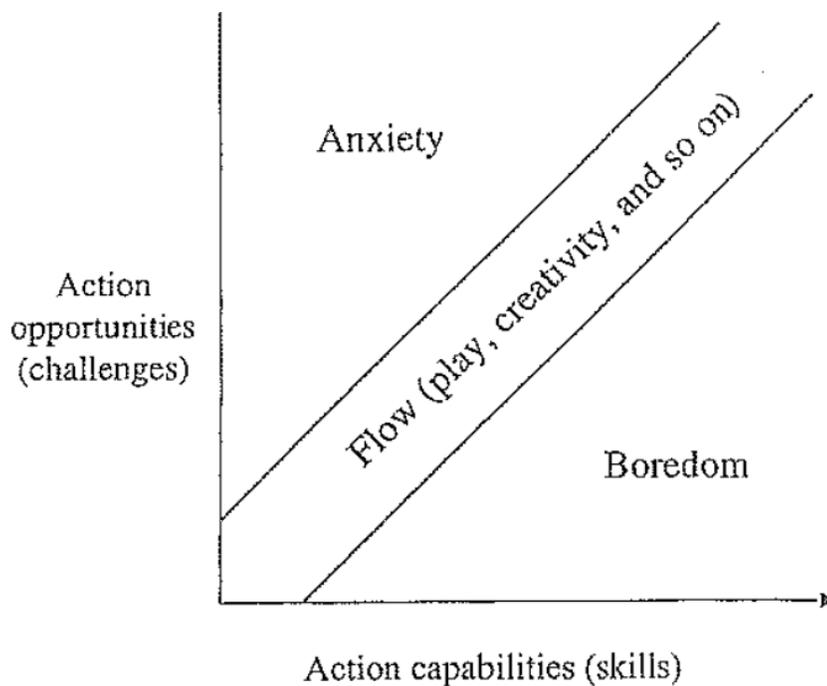

Figure 1. The flow channel (Nakamura & Csikszentmihalyi, 2002)

The Circumplex Model of Emotion

These three emotional states (flow, boredom, and anxiety) can be viewed as unique combinations of two separate dimensions of emotion. Current research often

views various different emotional states through the circumplex model. The circumplex model of affect conceptualizes human emotion as varying on two bipolar dimensions: pleasure-displeasure and degree of arousal (Russell, 1980). Evidence from laypersons' categorization of affect-related words and self-reported emotional states has found that emotional states relate to each other on these two dimensions and can be plotted on a grid to produce a circle (see Figure 2; Russell, 1980). This conceptualization seems to represent a universal view of emotion because similar results have been obtained using participants from a variety of cultural and linguistic backgrounds (Russell, Lewicka, & Niit, 1989). In this model, the pleasure-displeasure dimension is represented by the x-axis, and the degree of arousal is represented as the y-axis, so that the upper-right quadrant contains words describing pleasant, high arousal emotions such as "excited," the upper-left quadrant contains words describing unpleasant, high-arousal emotions such as "angry," the lower-left quadrant contains words describing unpleasant, low-arousal emotions such as "bored," and the lower-right quadrant contains words describing pleasant, low-arousal emotions such as "calm" (Russell, 1980).
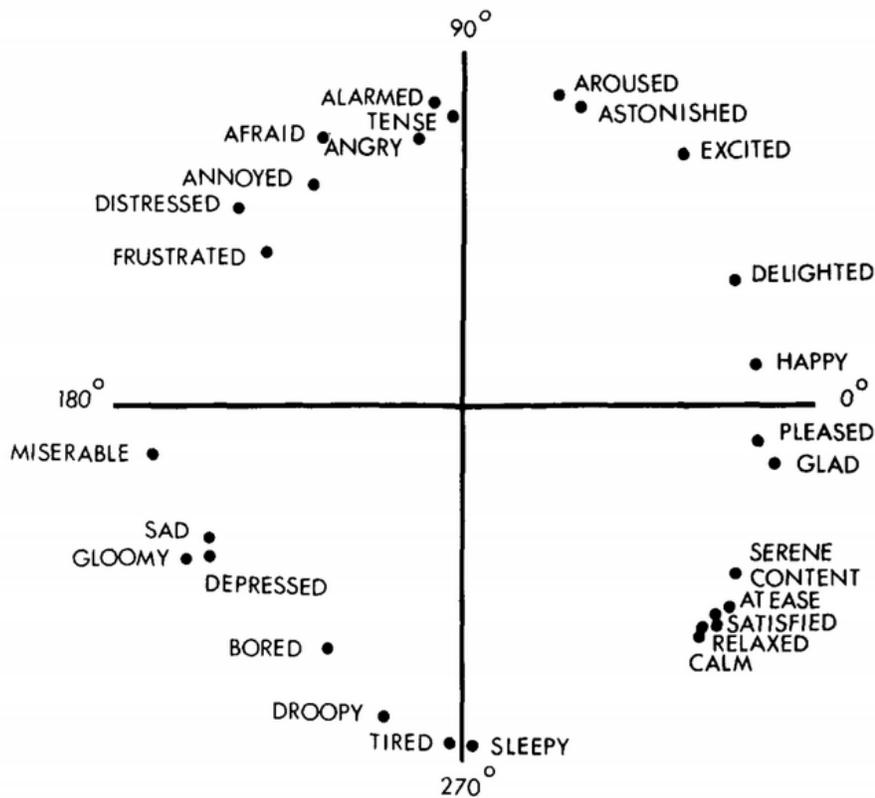
Figure 2. Affect-related words represented in a circumplex model (Russell, 1980)

Numerous emotional-states can be conceptualized as specific points within the circumplex. For example, since flow involves positive affect and high levels of concentration, it can be considered a high-arousal, pleasant emotional state, similar to excitement. Similarly, according to this model, boredom and anxiety correspond to unpleasant, low-arousal and unpleasant, high-arousal emotional states respectively. This view of the emotional states of flow, boredom, and anxiety can provide insight into the nature of flow and how it can be studied.

The Induction of Flow

A flow state requires two basic conditions. The first condition involves the perception that the level of a challenge and one's skills are balanced (Moller, Meier, &

Wall, 2010). When individuals are put into a position in which they are forced to implement the extent of their existing skills, the likelihood of flow increases. The second condition focuses on the nature of the task. When a task has clear and explicit goals and offers instantaneous feedback about an individual's progress, the flow state is easier to enter.

Correlational research was the primary method of studying flow in its early stages (Moller et al., 2010). The Experience Sampling Method became a popular method for studying flow states. Participants were given pagers that randomly beeped several times a day over several weeks. After each beep the participants were asked to report their experiences at that moment. These reports were used to derive correlations on experiencing flow in naturalistic contexts. These methods, however, were limited in that they consisted only of correlations and therefore were unable to prove causality.

Later, simple video games became the most popular means of studying flow (Moller et al., 2010). Rheinberg and Vollmeyer (2003) conducted two studies concerning two different video games with adjustable difficulty: Pacman and Robo guard. Difficulty level was judged based on the number of obstacles present and the speed at which the obstacles moved. Each participant played a game at three different levels of difficulty: very easy, optimal, and very difficult. In comparison to the very easy and very difficult trials, participants reported a significantly greater experience of flow in the optimal condition where the difficulty of the game more closely matched ability. Moller, Csikszentmihalyi, & Nakamura (2007) utilized a similar experimental induction procedure using Tetris, and also incorporated playing ability. The different levels of difficulty were set across conditions relative to each individual player's baseline ability,

and differed from each other only in game speed. Participants assigned to the flow condition (or optimal challenge) reported experiencing substantially greater flow and overall interest in the task in comparison to the underwhelming and overwhelming conditions. According to Moller at al. (2007), the determining factor was not game speed itself, but game speed relative to a player's ability. Thus, an individual with more skill required a more challenging game to reach a state of flow. Although Moller et al. (2007) did not test for the effects of the study on other emotional states, flow theory would suggest that the underwhelming condition should have induced boredom (because the task was less difficult than the skill level) and the overwhelming condition should have induced anxiety (because the task was more difficult than the skill level). Therefore, this procedure should be an effective way to induce these three categorically different emotional states.

Anxiety and Moral Judgments

Recent research has found that emotional states play an important role in making moral decisions. Greene, Sommerville, Nystrom, Darley, & Cohen (2001) created a 60-item moral judgment task in order to study the relationship between emotion and moral reasoning. This task presented participants with theoretical dilemmas in which they were asked yes or no questions about how they would act in a given hypothetical situation. Each question asked participants to choose between inaction and an action that would harm another person for a utilitarian purpose, such as saving others from harm or selfish gain. The dilemmas were divided into three categories based on their emotional salience. Moral-personal dilemmas were considered the most emotionally salient because the utilitarian act involved harming another individual in an "up close and personal" way

(Greene et al., 2001, p. 2106). Moral-impersonal dilemmas again required harming another person but in a less personal, and therefore less emotionally salient way. Non-moral dilemmas acted as a control because they did not involve harming a person and were not emotionally salient. For example, Greene et al. (2001) labeled the classic trolley problem as a moral-impersonal question. The dilemma describes a situation in which a runaway trolley will kill five people if it remains on its current track. However, one can pull a lever that switches the trolley to another track which would cause the trolley to kill one person but save the other five. The participant then must choose whether or not to pull the lever. The choice to pull the lever is considered the utilitarian response because it would lead to the least number of deaths. While this is a moral dilemma, it is impersonal because the utilitarian response requires choosing to cause harm to another indirectly. A modification on this dilemma results in the footbridge dilemma, in which the trolley can only be stopped by pushing another person off a footbridge and onto the tracks, killing him and saving the other five. The footbridge dilemma is considered moral-personal because in order to choose the utilitarian response (saving the five people) one must personally push another person to his death. The brain activity of the participants was monitored using fMRI while they were reasoning through these dilemmas. This study found that areas of the brain known to be associated with emotion were significantly more active while the participants were thinking through the moral-personal dilemmas than the moral-impersonal or non-moral dilemmas. Also, areas associated with working memory were significantly less active while participants were thinking through the moral-personal dilemmas than the moral-impersonal or non-moral dilemmas. This suggests that emotions inform moral judgments, but only when the dilemma is personal.

Other studies have used the same moral judgment task as Greene et al. (2001) to study how a stressful or anxious state affects moral decisions (Youssef et al., 2012; Perkins et al., 2013). Youssef et al. (2012) induced stress in half of their participants using the Trier Social Stress Test (TSST), in which participants perform a speech and an arithmetic task in front of a board of four people while being video recorded. This study found that the stressed group chose significantly fewer utilitarian responses on moral-personal questions than the control group. The study also found that females chose significantly fewer utilitarian responses on moral-personal dilemmas than males. No significant results were found for the responses on the moral-impersonal or the non-moral questions. Perkins et al. (2013) decreased the anxiety level of their experimental group using the anti-anxiety drug lorazepam. Again, using the moral judgment task from Green et al. (2001), Perkins et al. (2013) found that the experimental group chose significantly more utilitarian responses to moral-personal questions than the control group. There was no significant effect on the moral-impersonal or the non-moral questions. These results suggest that negative, high arousal emotional states, such as stress and anxiety, influence moral decision-making by making individuals less likely to harm others for a utilitarian purpose.

Hypotheses

This recent research has demonstrated that decisions made regarding moral dilemmas are not solely informed by reason and that emotion plays an important role in this decision-making process. Although studies have tested the effects of high anxiety and low anxiety (or calmness) on moral judgments, the research is lacking evidence pertaining to other emotional states. According to the circumplex model of affect, high

anxiety or stress and low anxiety or calmness differ from each other on both dimensions: pleasure-displeasure and degree of arousal. Therefore, the effects found in past studies could be caused by the change in (a) pleasure-displeasure, (b) the degree of arousal, (c) a combination of the two. The current research hoped to help fill in this gap by testing the effects of categorically different emotional states on a moral judgment task. Anxiety is a high arousal, unpleasant emotional state and boredom is a low arousal, unpleasant emotional state. Therefore, testing the effects of these two emotions against the effect of flow (a high arousal, pleasant emotional state) would better illustrate how the different dimensions of the emotional circumplex affect moral judgments. Based on past research and the circumplex model of affect, the current study could have produced two different patterns of results. If the degree of arousal is the critical factor in previous studies of emotion and moral decision-making, then participants in the flow and anxiety conditions would choose significantly fewer utilitarian responses on moral-personal questions than those in the boredom condition. On the other hand, if the pleasure-displeasure dimension is the critical difference, then participants in the anxiety and boredom conditions would choose significantly fewer utilitarian responses on moral-personal questions than those in the flow condition.

Method

Participants and Design

Thirty-six undergraduate students from Whitman College were recruited for a Whitman IRB approved study on Tetris and cognition. Participants were recruited through email and word of mouth convenience sampling. The researchers randomly assigned each participant to one of three conditions. One third of the participants were

assigned to the boredom condition, another third were assigned to the flow condition, and the last third were assigned to the anxiety condition. Thus, the research design of the study was a one-way between subjects design with three groups.

Measures

The self-report survey consisted of four scales (see Appendix): an emotional state scale, the Flow Short Scale, the State-Trait Anxiety Inventory for Adults, and the Moral Judgment Task. The first three scales acted as emotional state manipulation checks. The emotional state scale (Quinto & Thompson, 2013) is a 2-item Likert-type scale that asks participants to rate their current emotional state from 1 (very negative) to 7 (very positive) and their current arousal level from 1 (no energy, very sleepy) to 7 (extremely energetic, very lively). The Flow Short Scale (Rheinberg, Vollmeyer, & Engeser, 2003) is a 16-item Likert-type scale that measures components of flow experience. For the first 13 questions, participants indicated how well each statement described how they felt during the task from 1 (not at all) to 7 (very much). Sample questions include: "I am totally absorbed in what I am doing" and "I feel that I have everything under control." The last three questions of the Flow Short Scale ask the participant to rate the difficulty of the task from 1 (easy) to 9 (difficult), their own competency on the task from 1 (low) to 9 (high), and the demands of the task from 1 (low) to 9 (too high). The State-Trait Anxiety Inventory (Spielberger, 1968) is a 40-item Likert-type scale that measures the participants' current anxiety level. Participants indicated how well each statement described their current state from 1 (not at all) to 4 (very much so). Sample questions include "I feel confused," and "I am presently worrying over possible misfortunes."

The 60-item Moral Judgment Task (Greene et al., 2001) presents immoral, moral-impersonal, and moral personal dilemmas with yes or no questions in which the participants must either choose inaction ("no") or choose to hurt someone for a utilitarian purpose ("yes"). From this survey, we chose to include ten moral-impersonal and ten moral-personal questions. We chose not to include any immoral questions because past research has found no significant effects of emotional state on this measure (Youssef et al., 2012; Perkins et al., 2013). A sample moral-impersonal question includes: "You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Is it appropriate for you to hit the switch in order to avoid the deaths of the five workmen?" A sample moral-personal question includes: "You are in a hospital lounge waiting to visit a sick friend. A young man sitting next to you explains that his father is very ill. The doctors believe that he has a week to live at most. He explains further that his father has a substantial life insurance policy that expires at midnight. If his father dies before midnight, this young man will receive a very large sum of money. He says that the money would mean a great deal to him and that no good will come from his father's living a few more days. He offers you half a million dollars to go up to his father's room and smother his father with a pillow. Is it appropriate for you to kill this man's father in order to get money for yourself and this young man?"

Procedure

Participants were seated at individual computers in an academic computer lab. The researchers provided an explanation of their task, instructions on how to complete their task, and a background story about the project that included a mild deception. For the deception, the researchers claimed that past research has found that performance on the game Tetris is a good indicator of life outcomes, including problem-solving skills, academic achievements, and salaries. This deception was used to enhance the participants' experience of flow (Moller, Meier, & Wall, 2010) and anxiety by encouraging the participants to find the task personally meaningful and increasing motivation to perform well.

After they signed a consent form, the participants played two rounds of Tetris, following the same procedure used by Moller et al. (2007). Tetris is a single-player computer game in which differently shaped blocks move from the top of the screen to the bottom. The player is able to move the blocks left and right and rotate them in 90 degree increments using keys on the keyboard. The goal is to fit the blocks together to complete horizontal rows which then disappear and earn the player points. Thus, if a player continues to complete rows, gameplay can continue indefinitely. The game ends when incomplete rows of blocks stack vertically until they reach the top of the screen. First, participants played Tetris Marathon (Pajitnov, 1984) for six minutes or until the game ended. The Marathon version of Tetris changes levels, from one to ten, according to the skill of the player. As a player completes more rows and gameplay continues, the level increases. The levels vary in the speed at which the blocks move down the screen; in

level one, the blocks move very slowly, and in level ten, the blocks move very quickly. Participants then recorded the level they reached at the end of the first game.

Next, participants played a second round of Tetris (Pajitnov, 1984) in which the level remained the same throughout the game. Their assigned levels for the second round were based on their randomly chosen experimental condition and the level reached during the first round of play. Participants in the boredom condition were assigned ⅓ of the level they reached in the first round of Tetris, participants in the flow condition were assigned the same level they reached in the first round, and participants in the anxiety condition were assigned three times the level reached in the first round. In the second round, the participants played at their assigned levels for six minutes, restarting the game if it ended before the six minutes were completed. Afterwards, participants were asked to complete a 20-minute self-report survey, consisting of the emotional state scale, the Flow Short Scale, the State-Trait Anxiety Inventory for Adults, and the Moral Judgment Task. Then, the participants were debriefed, the deception was debunked, and the true purpose of the study was revealed. Participants then watched a short funny animal video to relieve any anxiety that may have been caused by the study. Finally, the participants were thanked for their participation, compensated with baked goods, and dismissed.

Results

Hypothesis Testing

One-way between subjects analyses of variance (ANOVAs) were used to determine if the participants' assigned experimental condition affected their responses on the moral judgment task. Contrary to the first hypothesis, participants in the anxiety ($M =$ 1.92, $SD = 0.13$) and flow conditions ($M = 1.83$, $SD = 0.16$) did not choose fewer

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utilitarian responses on moral-personal questions than participants in the boredom condition ($M = 1.94$, $SD = 0.08$), $F(2, 33) = 2.61$, $p = .09$. Contrary to the second hypothesis, participants in the anxiety ($M = 1.92$, $SD = 0.13$) and boredom conditions ($M = 1.94$, $SD = 0.08$) did not choose fewer utilitarian responses than those in the flow condition ($M = 1.83$, $SD = 0.16$), $F(2, 33) = 2.61$, $p = .09$.

Analysis also found no significant effect of experimental condition on moral-impersonal questions ($F(2, 33) = 0.46$, $p = 0.63$) or on all moral judgment questions ($F(2, 33) = 1.18$, $p = .32$).

Manipulation Checks

A second set of one-way ANOVAs was used to test the effectiveness of the emotional state manipulation. These tests showed that there was no significant effect of the experimental condition on the participants' scores on flow ($F(2, 33) = 0.72$, $p = .49$), anxiety ($F(2, 33) = 1.28$, $p = .29$), mood ($F(2, 33) = 0.31$, $p = .74$), or energy level ($F(2, 33) = 2.48$, $p = .10$). Contrary to intentions, the experimental conditions did not have significant effects on the participants' emotional states. Specifically, participants in the flow condition did not score higher on flow ($M = 4.10$, $SD = 0.96$) than participants in the anxiety ($M = 4.00$, $SD = 0.94$) and boredom conditions ($M = 4.41$, $SD = 0.60$); participants in the anxiety condition did not score higher on anxiety ($M = 2.14$, $SD = 0.58$) than those in the flow ($M = 2.01$, $SD = 0.38$) and boredom conditions ($M = 1.84$, $SD = 0.31$); participants in the flow condition did not score higher on mood ($M = 4.15$, $SD = 1.28$) than those in the boredom ($M = 4.55$, $SD = 0.93$) and anxiety conditions ($M = 4.33$, $SD = 1.37$); and participants in the anxiety ($M = 3.08$, $SD = 0.90$) and flow conditions (M

= 3.69, *SD* = 1.11) did not score higher on energy than those in the boredom condition (*M* = 4.00, *SD* = 1.00).

Possible Influence of Individual Dimensions of the Circumplex Model

Although the emotional state manipulation was ineffective, the participants did vary in their emotional states. In order to analyze the possible effects of these emotional states on the moral judgment task, we divided participants into groups based on their scores on each scale. First, "mood groups" were created by labeling mood scores ranging from 1 to 3 as "negative mood" and scores ranging from 5 to 7 as "positive mood." The data of participants who scored a 4 on mood were considered neutral and excluded from the analysis. One-way ANOVAs found that there was a significant effect of mood group on moral-personal questions (*F*(1, 20) = 5.77, *p* = .03), but no significant effect on participants' responses on moral-impersonal questions (*F*(1, 20) = 0.95, *p* = .34) or on all moral questions (*F*(1, 20) = 0.99, *p* = .33). Those participants who were in a positive mood chose significantly fewer utilitarian responses on moral-personal questions (*M* = 1.92, *SD* = 0.12) than those in a negative mood (*M* = 1.78, *SD* = 0.17).

The same procedure used to create the mood groups was repeated to divide the data into two "energy groups" based on the participants' scores on energy level. A one-way ANOVA found no significant effect of energy group on moral-impersonal questions (*F*(1, 25) = 0.48, *p* = .50), moral-personal questions (*F*(1, 25) = 1.05, *p* = .32), or all moral questions (*F*(1, 25) = 0.00, *p* = .96).

Although the anxiety and flow scales did not directly measure the dimensions of the circumplex model of affect, they could have provided relevant information about how those dimensions affect moral judgments. In order to analyze the possible effects of these

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two scales, first "anxiety groups" were created by labeling anxiety scores above 2.6 as "high anxiety," labeling scores ranging from 1.7 to 2.5 as "moderate anxiety," and labeling scores 1.6 and lower as "low anxiety." These ranges were chosen based on preexisting groupings in the distributions of scores. A one-way ANOVA revealed no significant effects of the anxiety groups on the participants' responses to moral-impersonal questions ($F(2, 33) = 0.54$, $p = .59$), moral-personal questions ($F(2, 33)$ $=1.62$, $p = .21$), or all moral questions ($F(2, 33) = 1.73$, $p = .19$).

Next, "flow groups" were created by separating participants into two groups based on flow scores using the mean flow score as the dividing point. Scores ranging from 1 to 4.16 were labeled "low flow" and scores ranging from 4.17 to 7 were labeled "high flow." A one way ANOVA found no significant effect of flow group on the participants' responses to moral-impersonal questions ($F(1, 34) = 0.00$, $p = 1.00$), moral-personal questions ($F(1, 34) = 0.25$, $p = .62$), or all moral questions ($F(1, 34) = 0.10$, $p = .76$).

Exploratory Analyses

While it did not pertain to any hypotheses, a final ANOVA found that there was no significant effect of gender on moral-impersonal questions ($F(1, 34) = 0.91$, $p = .35$), moral-personal questions ($F(1, 34) = 0.09$, $p = .76$), or on all moral questions ($F(1, 34) = 0.81$, $p = .37$).

Discussion

The current study hoped to expand our understanding of the role of emotions in making moral decisions. Based on the circumplex model of affect and limited past research on the subject, we created two competing hypotheses. The first hypothesis

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predicted that if the degree of arousal is the critical factor that affects moral decision-making, then participants in the anxiety and flow conditions would choose significantly fewer utilitarian responses on personal moral questions than those in the boredom condition. The second hypothesis predicted that if the pleasure-displeasure dimension is the critical factor that affects moral decision-making, then participants in the anxiety and boredom conditions would choose significantly fewer utilitarian responses on personal moral questions than those in the flow condition. However, we did not find any significant effect of condition on the moral judgment task. Therefore, these results did not conclusively support either hypothesis. This lack of significance is likely explained by the fact that the Tetris task did not seem to successfully manipulate the participants' emotional states. Although the current study followed the same procedure as used by Moller et al. (2007), the emotional state manipulation did not cause significantly different scores on the emotional state scale, the Flow Short Scale, or the State-Trait Anxiety Inventory for Adults. Therefore, it is unclear if a more successful manipulation would have produced results that supported one of our hypotheses. Furthermore, the fact that the study found Tetris to be ineffective at manipulating emotional states suggests that other types of tasks may be more effective in research on flow theory. It would perhaps be better to implement a manipulation in which the task created more intrinsic motivation, as in sports competitions or art projects, since flow research originally stemmed from studying such activities (Nakamura & Csikszentmihalyi, 2002). The study was also unable to replicate the results of past studies, which found an effect of anxiety level and gender on moral judgments (Youssef et al., 2012; Perkins et al., 2013).

Although neither of our hypotheses was supported by the results, we did find a significant effect of the participants' mood on their responses on the moral judgement task. The mood ratings of the participants captured the pleasure or displeasure of their emotional states, where higher mood scores meant more positive or pleasurable emotional states. The study found that participants in a negative mood state chose significantly more utilitarian responses on personal moral questions than those in a positive mood state. This suggests that individuals in a negative emotional state are more likely to choose utilitarian actions. Furthermore, we did not find significant results of the energy level (or arousal) on the participants' responses on the moral judgement task. These results suggest that the pleasure-displeasure dimension of emotion does affect moral reasoning while arousal either does not, or has less of an effect. Although these findings do not directly support or reject either of the hypotheses, they do suggest that the study might have found results that directly oppose the second hypothesis if the emotional state manipulation had been successful. This would suggest that anxiety or boredom (unpleasant emotional states) would lead to more utilitarian decisions than flow, a pleasurable emotional state. In other words, individuals in a less pleasurable emotional state, such as anxiety or boredom, would be more likely to choose to act for some particular purpose, even if such an action involves harming another person, than individuals in a more pleasurable emotional state. This finding opposes the results of past studies which found that anxiety and stress (negative emotional states) led to fewer utilitarian responses (Youssef et al., 2012; Perkins et al., 2013). While it is unclear why the current study found opposing results, it is possible that the mood ratings were affected

by other negative emotional states such as anger or frustration. Such emotional states could differ from anxiety or stress in their effects on moral judgments.

The results of this experiment could have important implications for our conceptions of responsibility for moral decisions. If our emotional states can be manipulated by our environment, then those emotional states may not be entirely within our control. However, this and other recent studies (Greene et al., 2001; Youssef et al., 2012; Perkins et al., 2013) suggest that our emotional states importantly affect how we make moral decisions. Consequently, at least in the case of moral-personal dilemmas, it seems that we are not entirely in control of the decisions that we make. Therefore, we may also not be entirely responsible for our actions in such circumstances. This reduction (or even elimination) of responsibility may in turn affect how we treat and judge individuals based on their moral decisions.

A more thorough understanding of how individuals make moral decisions could also have important implications for individuals who must make such decisions regularly. For example, a police officer may be more wary of a negative mood if he were aware that it could hinder his ability to make good moral decisions in the field. Perhaps this awareness of one's emotional state would be a useful component of the training procedures for police officers, firemen, surgeons, lawyers, and other individuals who are more likely than the average person to be confronted with moral dilemmas, and whose careers may have a significant impact on their emotions.

A few factors may have limited the outcome of our results. First, the participant demographic was highly homogenous. The majority of the Whitman student demographic tends to consist of high-income, high-achieving, and physically-active

individuals. Considering that all of our participants were Whitman students, we suspect that our results may not be representative of a larger, more diverse population. Also, with only 36 participants, our results lacked statistical power. Had we achieved our goal of 50 participants, we may have found more significant results. Another limiting factor we believe that could have affected our results occurred during the data collection procedure. When we asked participants to play the second round of Tetris, unpredictable online advertisements would occasionally interrupt the participants during gameplay. These advertisements may have hindered our results by affecting the participants' levels of mood, anxiety, flow, and boredom, and therefore inhibiting the emotional state manipulation. Lastly, the ineffectiveness of the emotional state manipulation task limited our ability to successfully test the hypotheses.

Future research should focus on clarifying how emotions affect moral reasoning by studying emotional states that have not yet been tested. Research on the effects of various emotional states that differ on the pleasure-displeasure dimension would help either support or refute the findings of the current study. Such experiments may also lead to new theories about how emotions vary from each other in their effects on moral judgments. Such knowledge could prove invaluable to our understanding of the nature of our own morality. Furthermore, such research should expand to include participants from a variety of cultural and ethnic backgrounds in order to learn more about the potential universality of such theories.

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Appendix

Survey

QG Which of the following best describes you?
- ⭕ Male (1)
- ⭕ Female (2)
- ⭕ I do not wish to specify (3)

Q1a Please indicate your current mood
- ⭕ 1-Very Negative (1)
- ⭕ 2 (2)
- ⭕ 3 (3)
- ⭕ 4 (4)
- ⭕ 5 (5)
- ⭕ 6 (6)
- ⭕ 7-Very Positive (7)

Q2a Please indicate your current energy level
- ⭕ 1-Very Sleepy, No Energy (1)
- ⭕ 2 (2)
- ⭕ 3 (3)
- ⭕ 4 (4)
- ⭕ 5 (5)
- ⭕ 6 (6)
- ⭕ 7-Extremely Energetic, Very Lively (7)

Select the bubble that best describes how much each sentence applies to how you felt during the activity you just completed:

Q1 I felt just the right amount of challenge
- ⭕ 1-Not at all (1)
- ⭕ 2 (2)
- ⭕ 3 (3)
- ⭕ 4-Partly (4)
- ⭕ 5 (5)
- ⭕ 6 (6)
- ⭕ 7-Very much (7)

Q2 My thoughts/activities ran fluidly and smoothly
- ⭕ 1-Not at all (1)
- ⭕ 2 (2)
- ⭕ 3 (3)
- ⭕ 4-Partly (4)
- ⭕ 5 (5)
- ⭕ 6 (6)
- ⭕ 7-Very much (7)

Q3 I did not notice time passing
- ○ 1-Not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4-Partly (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7-Very much (7)

Q4 I had no difficulty concentrating
- ○ 1-Not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4-Partly (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7-Very much (7)

Q5 My mind was completely clear
- ○ 1-Not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4-Partly (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7-Very much (7)

Q6 I was totally absorbed in what I was doing
- ○ 1-Not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4-Partly (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7-Very much (7)

Q7 The right thoughts/movements occurred of their own accord
- ○ 1-Not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4-Partly (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7-Very much (7)

Q8 I knew what I had to do each step of the way
- ○ 1-Not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4-Partly (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7-Very much (7)

Q9 I felt that I had everything under control
- ❍ 1-Not at all (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4-Partly (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7-Very much (7)

Q10 I was completely lost in thought
- ❍ 1-Not at all (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4-Party (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7-Very much (7)

Q11 Something important to me was at stake
- ❍ 1-Not at all (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4-Partly (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7-Very much (7)

Q12 I hope I didn't make any mistakes
- ❍ 1-Not at all (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4-Partly (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7-Very much (7)

Q13 I was worried about failing
- ❍ 1-Not at all (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4-Partly (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7-Very much (7)

Q14 Compared to all other activities which I partake in, this one was...
- ◯ 1-easy (1)
- ◯ 2 (2)
- ◯ 3 (3)
- ◯ 4 (4)
- ◯ 5 (5)
- ◯ 6 (6)
- ◯ 7 (7)
- ◯ 8 (8)
- ◯ 9-difficult (9)

Q15 I think that my competence in this area was...
- ◯ 1-low (1)
- ◯ 2 (2)
- ◯ 3 (3)
- ◯ 4 (4)
- ◯ 5 (5)
- ◯ 6 (6)
- ◯ 7 (7)
- ◯ 8 (8)
- ◯ 9-high (9)

Q16 For me personally, the demands were...
- ◯ 1-low (1)
- ◯ 2 (2)
- ◯ 3 (3)
- ◯ 4 (4)
- ◯ 5-just right (5)
- ◯ 6 (6)
- ◯ 7 (7)
- ◯ 8 (8)
- ◯ 9-too high (9)

Q17 Select the bubble that indicates how you feel right now:I feel calm
- ◯ Not at all (1)
- ◯ Somewhat (2)
- ◯ Moderately so (3)
- ◯ Very much so (4)

Q18 I feel secure
- ◯ Not at all (1)
- ◯ Somewhat (2)
- ◯ Moderately so (3)
- ◯ Very much so (4)

Q19 I am tense
- ◯ Not at all (1)
- ◯ Somewhat (2)
- ◯ Moderately so (3)
- ◯ Very much so (4)

Q20 I feel strained
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q21 I feel at ease
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q22 I feel upset
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q23 I am presently worrying over the possible misfortunes
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q24 I feel satisfied
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q25 I feel frightened
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q26 I feel comfortable
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q27 I feel self-confident
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q28 I feel nervous
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q29 I am jittery
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q30 I feel indecisive
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q31 I am relaxed
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q32 I feel content
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q33 I am worried
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q34 I feel confused
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q35 I feel steady
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Q36 I feel pleasant
- ❍ Not at all (1)
- ❍ Somewhat (2)
- ❍ Moderately so (3)
- ❍ Very much so (4)

Please choose Yes or No for the following questions. Do not spend too much time on any one question.

Q37 You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will

cause the trolley to proceed to the right, causing the death of the single workman. Is it appropriate for you to hit the switch in order to avoid the deaths of the five workmen?

❍ Yes (1)
❍ No (2)

Q38 While on vacation on a remote island, you are fishing from a seaside dock. You observe a group of tourists board a small boat and set sail for a nearby island. Soon after their departure you hear over the radio that there is a violent storm brewing, a storm that is sure to intercept them. The only way that you can ensure their safety is to warn them by borrowing a nearby speedboat. The speedboat belongs to a miserly tycoon who would not take kindly to your borrowing his property. Is it appropriate for you to borrow the speedboat in order to warn the tourists about the storm?

❍ Yes (1)
❍ No (2)

Q39 Your plane has crashed in the Himalayas. The only survivors are yourself, another man, and a young boy. The three of you travel for days, battling extreme cold and wind. Your only chance at survival is to find your way to a small village on the other side of the mountain, several days away. The boy has a broken leg and cannot move very quickly. His chances of surviving the journey are essentially zero. Without food, you and the other man will probably die as well. The other man suggests that you sacrifice the boy and eat his remains over the next few days. Is it appropriate to kill this boy so that you and the other man may survive your journey to safety?

❍ Yes (1)
❍ No (2)

Q40 Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables. Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death. Is it appropriate for you to smother your child in order to save yourself and the other townspeople?

❍ Yes (1)
❍ No (2)

Q41 You are at home one day when the mail arrives. You receive a letter from a reputable international aid organization. The letter asks you to make a donation of two hundred dollars to their organization. The letter explains that a two hundred-dollar donation will allow this organization to provide needed medical attention to some poor people in another part of the world. Is it appropriate for you to not make a donation to this organization in order to save money?

❍ Yes (1)
❍ No (2)

Q42 You are visiting the sculpture garden of a wealthy art collector. The garden overlooks a valley containing a set of train tracks. A railway workman is working on the tracks, and an empty runaway trolley is heading down the tracks toward the workman. The only way to save the workman's life is to push one of the art collector's prized sculptures down into the valley so that it will roll onto the tracks and block the trolley's passage. Doing this will destroy the sculpture. Is it appropriate for you to destroy the sculpture in order to save this workman's life?

❍ Yes (1)
❍ No (2)

Q43 You are a member of a government legislature. The legislature is deciding between two different policies concerning environmental hazards. Policy A has a 90% chance of causing no deaths at all and has a

10% chance of causing 1000 deaths. Policy B has an 88% chance of causing no deaths and a 12% chance of causing 10 deaths. Is it appropriate for you to vote for Policy B over Policy A?

❍ Yes (1)
❍ No (2)

Q44 You are a doctor. You have five patients, each of whom is about to die due to a failing organ of some kind. You have another patient who is healthy. The only way that you can save the lives of the first five patients is to transplant five of this young man's organs (against his will) into the bodies of the other five patients. If you do this, the young man will die, but the other five patients will live. Is it appropriate for you to perform this transplant in order to save five of your patients?

❍ Yes (1)
❍ No (2)

Q45 You are in hospital lounge waiting to visit a sick friend. A young man sitting next to you explains that his father is very ill. The doctors believe that he has a week to live at most. He explains further that his father has a substantial life insurance policy that expires at midnight. If his father dies before midnight, this young man will receive a very large sum of money. He says that the money would mean a great deal to him and that no good will come from his father's living a few more days. He offers you half a million dollars to go up to his father's room and smother his father with a pillow. Is it appropriate for you to kill this man's father in order to get money for yourself and this young man?

❍ Yes (1)
❍ No (2)

Q46 You are driving along a country road when you hear a plea for help coming from some roadside bushes. You pull over and encounter a man whose legs are covered with blood. The man explains that he has had an accident while hiking and asks you to take him to a nearby hospital. Your initial inclination is to help this man, who will probably lose his leg if he does not get to the hospital soon. However, if you give this man a lift, his blood will ruin the leather upholstery of your car. Is it appropriate for you to leave this man by the side of the road in order to preserve your leather upholstery?

❍ Yes (1)
❍ No (2)

Q47 You are on a cruise ship when there is a fire on board, and the ship has to be abandoned. The lifeboats are carrying many more people than they were designed to carry. The lifeboat you're in is sitting dangerously low in the water-a few inches lower and it will sink. The seas start to get rough, and the boat begins to fill with water. It seems to you that there is only one way to stop the boat from sinking, and that is to start throwing other passengers overboard, starting with old people who are too weak to resist. Is it appropriate for you to throw some of your fellow passengers overboard in order to save yourself and the remaining passengers?

❍ Yes (1)
❍ No (2)

Q48 You and a group of ecologists are studying the wildlife in a remote stretch of jungle when you are captured by a group of paramilitary terrorists. You are held hostage for several days. One of the terrorists takes a liking to you. He informs you that his leader intends to kill you and the rest of the hostages the following morning. He says that he is willing to help you escape, but that he needs some assurance that you will not go to the police. He devises the following plan. He will videotape you while you kill one of your sleeping colleagues. The tape will ensure your silence, making it possible for you to escape. Is it appropriate for you to kill your colleague in order to escape from the terrorists and save your own life?

❍ Yes (1)
❍ No (2)

Q49 You work for the Bureau of Health, a government agency. You are deciding whether or not your agency should encourage the use of a certain recently developed vaccine. The vast majority of people who

take the vaccine develop an immunity to a certain deadly disease, but a very small number of people who take the vaccine will actually get the disease that the vaccine is designed to prevent. All the available evidence, which is very strong, suggests that the chances of getting the disease due to lack of vaccination are much higher than the chances of getting the disease by taking the vaccine. Is it appropriate for you to direct your agency to encourage the use of this vaccine in order to promote national health?

❍ Yes (1)
❍ No (2)

Q50 You have a friend who has been trying to find a job lately without much success. He figured that he would be more likely to get hired if he had a more impressive resume. He decided to put some false information on his resume in order to make it more impressive. By doing this he ultimately managed to get hired, beating out several candidates who were actually more qualified than he. Was it appropriate for your friend to put false information on his resume in order to help him find employment?

❍ Yes (1)
❍ No (2)

Q51 You are the owner of a small business trying to make ends meet. It occurs to you that you could lower your taxes by pretending that some of your personal expenses are business expenses. For example, you could pretend that the stereo in your bedroom is being used in the lounge at the office, or that your dinners out with your wife are dinners with clients. Is it appropriate for you to pretend that certain personal expenses are business expenses in order to lower your taxes?

❍ Yes (1)
❍ No (2)

Q52 You are the head of a poor household in a developing country. Your crops have failed for the second year in a row, and it appears that you have no way to feed your family. Your sons, ages eight and ten, are too young to go off to the city where there are jobs, but your daughter could fare better. You know a man from your village who lives in the city and who makes sexually explicit films featuring small children such as your daughter. He tells you that in one year of working in his studio your daughter could earn enough money to keep your family fed for several growing seasons. Is it appropriate for you to employ your daughter in the child pornography industry in order to feed your family?

❍ Yes (1)
❍ No (2)

Q53 A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Is it appropriate for you to push the stranger on to the tracks in order to save the five workmen?

❍ Yes (1)
❍ No (2)

Q54 You are a young architect visiting one of your construction sites with your boss. Your boss is a despicable individual who makes everyone around him miserable including you. It occurs to you that if you were to push him off of the building you are inspecting he would fall to his death and everyone would think it was an accident. Is it appropriate for you to push your boss off of the building in order to get him out of your life?

❍ Yes (1)
❍ No (2)

Q55 You are the late-night watchman in a hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital's ventilation system. In a certain room of the hospital are three patients. In another room there is a single patient. If you do nothing the fumes will rise up into the room

containing the three patients and cause their deaths. The only way to avoid the deaths of these patients is to hit a certain switch, which will cause the fumes to bypass the room containing the three patients. As a result of doing this the fumes will enter the room containing the single patient, causing his death. Is it appropriate for you to hit the switch in order to avoid the deaths of the three patients?

○ Yes (1)
○ No (2)

Q56 You are a member of a government legislature. The legislature is deciding between two different policies concerning environmental hazards. Policy A has a 90% chance of causing no deaths at all and has a 10% chance of causing 1000 deaths. Policy B has a 92% chance of causing no deaths and an 8% chance of causing 10,000 deaths. Is it appropriate for you to vote for Policy A over Policy B?

○ Yes (1)
○ No (2)

Q73 DO NOT ANSWER UNTIL DEBRIEFING IS COMPLETE.Please check here if you agree to release your results for our study

○ I agree (1)