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Influences on Moral Decision Making

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Abstract

The growing field of moral psychology has demonstrated promise for understanding how we make moral decisions. Researchers ask you to choose your actions in a specific moral scenario. For example, would you sacrifice one person for five? This research study tests the effect of different scenario wording on responses to moral dilemmas, which are scenarios that place the judge in a conflicted moral situation. Moral questions include three types: personal moral, impersonal moral, and non-moral. These questions were manipulated to appear in one of four conditions. Two conditions featured second person or third person perspectives, and two conditions utilized either 'would' questions or 'should' questions. Participants made utilitarian (greatest good for the most people) or non-utilitarian decisions for thirty scenarios containing all three types of moral questions. Results show an interaction effect between the second/third person wording and would/should question types. People were more likely to make utilitarian judgments when deciding what others would do. Implications include validation of measurement accuracy for moral scenarios, and discussion offers greater understanding of how we make moral decisions both consciously and unconsciously.

Influences on Moral Decision Making

Looking Into Moral Psychology

Imagine you are in a position where you must make a moral decision. The situation is such that you must decide immediately, and regardless of your choice someone will get hurt. How would you decide what to do? Perhaps you would make your decision based on the outcomes that each option is likely to bring about, or you might use a guiding rule or principle to make your decision. Maybe you will have a strong instinct about what to do, or maybe you will deliberate but never be sure that your decision is right. The processes involved in moral judgment and decision making are largely unknown to both scientists and ourselves.

Fortunately there are some who wish to make these processes clear. The field of moral psychology is dedicated to studying factors that influence our moral decisions. Moral psychology is a new field. It takes philosophical questions about right and wrong and combines them with psychological and neurological methods to explore the mechanisms underlying everyday moral judgment. This allows researchers to study the processes employed in moral decision-making. While there has been interesting research about external influences and the role of brain function on moral decision-making (Greene et al. 2001) , there has been less research on the moral dilemmas themselves.

A Background to Moral Psychology

In a life and death situation, would you sacrifice one man for five? A majority of people say yes (Greene et al. 2001). Now, if you had to physically place a man in harm's way, would you sacrifice that one man for five others (Greene et al. 2001)? This time, the majority of people say

no. In moral dilemma experiments conducted by Josh Greene participants must make either a utilitarian or non-utilitarian decision regarding each moral scenario. Utilitarian responses cause the greatest good for the most people, while non-utilitarian decisions benefit the self or only a few. The majority of participants made the utilitarian decision when they decided to sacrifice one person for five. However, when the participant must agree to personally place the victim in harm's way, the majority of responses were non-utilitarian. Responses to these two moral dilemmas were opposite one another, but these two scenarios are only different in detail. This conundrum is where Joshua Greene began his research into moral decision-making, and where the field gained unexpected recognition.

In reaction to Greene's (2004) study, moral psychology was given press in such places as the New York Times (Appiah, 2007). Interestingly, before these studies researchers had only a vague idea about what actually goes through our minds in the face of a moral dilemma. However, Greene's studies asked people moral questions while inside an fMRI (brain imaging) scanner. This allowed researchers to pinpoint areas of the brain that activate during decision making tasks (Greene, Nystrom, Engell, Darley, & Cohen, 2004), the first research of its kind.

Moral decision studies have since sought to widen the field to help explain differences in our decision making strategies and outcomes. Overall the research has expanded the range of moral questioning to include topics such as blame and guilt (Cushman, Knobe, Sinnott-Armstrong, 2008), and the effects of personality on moral awareness (Reynolds & Ceranic, 2007). However, one area that has not been studied intensely is the inherent effects of the original set of moral questions used in these studies.

The way that we perceive and react to the world around us is influenced by many factors. Past research shows that the room we sit in can effect our perceptions and reactions during a

decision – making task (Barmack, 1939). As well, our past experiences and current temperament contribute to the way we approach novel experiences. In many studies these factors can be accounted for by randomizing participants, a procedure that all moral psychology studies have followed. Moral psychology has also explored how a moral question's intensity affects responses (Greene, 2004). However, other influencing factors, such as the actual wording of each scenario, were not strongly considered.

Research has shown that wording itself can be a major influence on our perception of situations (Segal et al. 1997). Indeed, Segal et al. (1997) found that in literary stories the point of view greatly influences the way that participants interpret a story. Thus it is clear that wording affects the way that a scenario is perceived, thus wording could have an effect on how readers view moral situations. As well, it was found that the degree to which participants find wording familiar affects whether they will respond with an emotional or rational framework. Lehman, Krosnick, West, & Li (1992) demonstrated that primed, re-appearing wording made unemotional material an emotional topic. As well, Semin & De Poot (1997) discovered that prior conceptions about guilt placement directly influenced word choice for participants describing a situation. Semin & De Poot (1997) demonstrated that we use words to show our judgments, and we rely upon wording to direct our methods of evaluating situations.

Furthermore, there is evidence that wording has an influence upon the type of system used in evaluation. Thoma & Rest (1999) showed that people encountering moral situations for the first time answered questions emotionally, but when they revisited these questions their responses adhered to a "non-emotional basic moral framework." Here, two separate frameworks were used to evaluate situations. As well, Sweeney & Costello (2009) demonstrated that the emotional content and immediacy of a moral situation has direct influence on the method of

response. These researchers were able to discern different and separate modes of decision making, depending upon context. Finally Greene, Morelli, Lowenberg, Nystrom, & Cohen (2008) found that when cognition is taxed during a moral decision task, questions are answered emotionally. This showed that rationale and emotion operate as separate processes.

There is sufficient evidence for the effect of wording on not only the perception of a situation but also upon the method used to assess a situation. However this knowledge has not been applied to the popular moral dilemmas used by Greene and others. One example of a moral dilemma is as follows. "You are the captain of a military submarine travelling underneath a large iceberg. An onboard explosion has caused you to lose most of your oxygen supply and has injured one of your crew who is quickly losing blood. The injured crew member is going to die from his wounds no matter what happens. The remaining oxygen is not sufficient for the entire crew to make it to the surface. The only way to save the other crew members is to shoot dead the injured crew member so that there will be just enough oxygen for the rest of the crew to survive. Would you kill the fatally injured crew member in order to save the lives of the remaining crew members? (Greene et al., 2001)

Thus this study will focus on two word changes and their effects on answers to moral dilemmas. The first manipulation involves the point of view, asking questions in either *second person* or *third person*. These wording manipulations aim to discern decisions and decision making strategies regarding the self vs. decisions and strategies regarding others. Also there will be questions asked as *what would you do?* or *what should you do?* This manipulation is aimed at separating motivating factors in the instructions that may influence decision making methods. Hopefully dilemma response results will shed light on whether wording can influence the mindsets used in moral decision making. Overall the outcome of this research will help

determine whether the original research by Greene is validated. As well this findings will potentially add to the credibility of work with moral questions in this exponentially growing field.

Research Questions

1. Will a self / other difference (manifested by 2nd person or 3rd person questions) in moral dilemmas affect the rate of utilitarian responses?
2. Will a question type difference (manifested by would or should questions) affect the rate of utilitarian responses?
3. Will the interaction of both person and question manipulation of moral dilemmas affect the rate of utilitarian responses?

Method

Participants

One hundred and thirty four University of Arizona undergraduate students were recruited to participate in this study. Of the one hundred thirty four, there were 93 females and 41 males ranging from ages eighteen to thirty one in a wide variety of majors. A subject pool was used to recruit students from the general education course *Structure of Mind and Behavior* for the Spring 2009 and Fall 2010 semesters. As part of enrollment in this course undergraduates were asked to complete eight credits of study participation. This study awarded two credits.

Design

This research study employed a 2 (Person: 2nd Person, 3rd Person) x 2 (Question Type: Would you, Should you) x 3 (Scenario type: Personal Moral, Impersonal Moral, Non-Moral) mixed design. Person and Question type were between subject variables while Scenario type was a within-subject variable. The dependent measure was the response to each scenario question.

Measures & Materials

Responses to moral scenarios were assessed by Yes/No answers. Moral scenarios were either personal moral, impersonal moral, or non-moral. Scenarios were categorized according to the criteria outlined in Greene et al. (2001). The experiment was designed and run using E-Prime, a computerized experiment design program. Participants responded to 30 scenarios, 10 of each type (see Appendix A for all dilemmas). Scenarios were presented one at a time with the scenario order randomized. On each trial, participants would first be presented with a scenario. Once they had read the scenario, participants pressed the space bar to advance to the question screen. The question screen contained one Yes/No question about the scenario. Participants logged their responses to each scenario question by pressing the “Q” key for Yes or the “P” key for No . Yes answers indicated a utilitarian response; no answers indicated a non-utilitarian response.

Materials included a consent form outlining participation requirements, risks, and compensation (Appendix B). A post-experiment questionnaire was used, asking for demographic information including age, gender, major, class standing, time until degree completion, and political affiliation if any. Participants were given a credit slip for their

participation, and a debriefing form which described the experiment purpose, design, and expected results.

Procedure

Participants signed up for participation on the subject pool website, where they were told that the study was a decision making task. Upon arrival, students were asked to choose one of three small rooms to work in, each with one laptop inside. Each laptop had one of the four conditions preloaded onto it. Conditions and laptops were always assigned in random order. Participants were run individually, but up to three participants were run one at a time.

First participants read and signed the consent form. Next they were instructed to read the instructions on the laptop screen, pressing any key to advance to the following instruction screens. After the instructions, participants completed three practice trials on the laptop. The first two were non-moral scenarios and the third was a personal moral scenario. Each practice trial presented the scenario on the first screen and the question on the second screen. Participants indicated their responses on the second screen and experienced a five second pause on a third blank screen. After the three practice trials, participants were instructed to alert the experimenter. The experimenter verified that the participant understood the procedure and asked for questions. The experimenter then began the primary task on the laptop for the participant.

The independent variables were the point of view that the scenario appeared in (2nd Person or 3rd Person) and the Question that appeared (either would you or should you). A full-factorial design was used, creating four independent conditions. Participants were assigned to one of these conditions randomly. The dependent variable was the response (Yes or No) to each

scenario. Each response was recorded through button presses on the question screen of each trial.

Participants were given an unlimited amount of time to complete the task. However most took between 15 and 30 minutes. After the task was concluded, students were given the demographic questionnaire to complete. Participants were then debriefed, compensated, allowed to ask questions, and thanked for their participation.

Results

Data Analysis

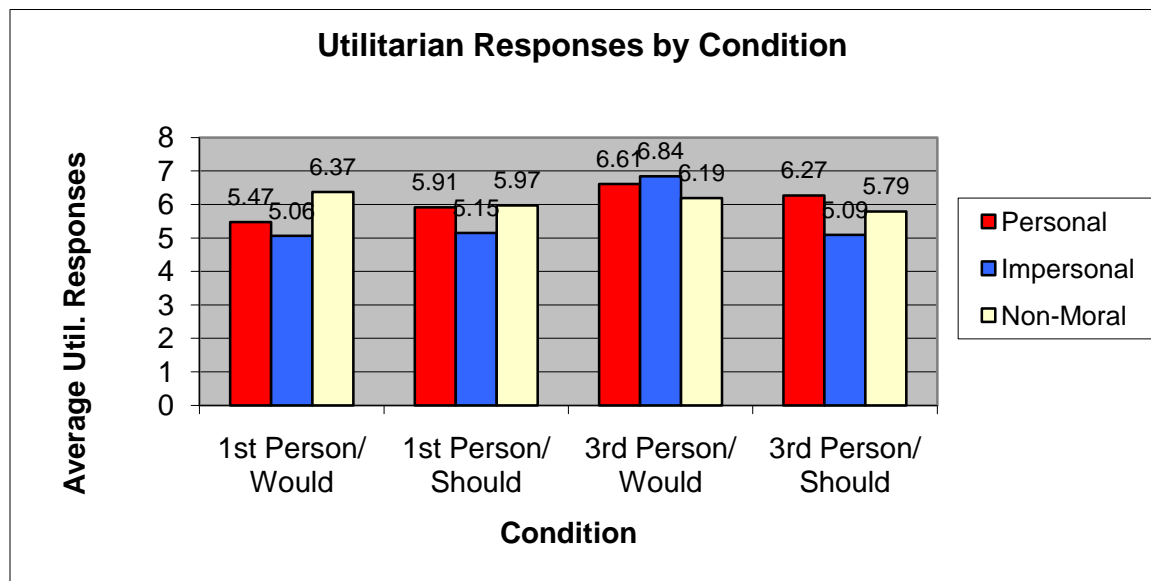
An analysis was run using a 2 (person type: 2nd, 3rd) x 2 (question type: would, should) x 3 (dilemma-type: personal, impersonal, non moral) mixed-factor analysis of variance (ANOVA). The dependent variable measured the rate of utilitarian responses. This rate was defined as the percent of utilitarian responses per dilemma type (i.e. personal, impersonal, non moral). All analyses were conducted with SPSS statistical software (version 17).

The ANOVA yielded a main effect of question type, $F(1,125) = 4.81, p < .05$, and also a main effect of person, $F(1,125) = 7.00, p < .05$. As well, the analysis demonstrated an interaction effect of question type and person type, $F(1,125) = 5.86, p < .05$. This study aimed to investigate wording influences on moral dilemma responses. The person manipulation (Research Question One) produced a significant effect. Thus, the difference between second person ($M = 5.66$) and third person ($M = 6.13$) question types is sufficient to elicit statistically different responses. This data may demonstrate different participant estimations of others' morals in comparison to their own.

Dilemma question type (Research Question Two) also significantly influences utilitarian responses. The data shows a marked difference between would (M = 6.39) and should utilitarian responses (M = 5.67). Therefore wording does manipulate utilitarian responses. As well, the ANOVA shows that would questions and should questions are interpreted differently in moral settings.

The interaction of person and question type (Research Question Three) is significant as well. This shows that not only do person and question independently influence the rate of utilitarian responses, but that their four combinations also affect responses. Next is a close look at each experiment condition to further understand this significant interaction.

Figure 1:



Discussion

This research set out to determine whether the original dilemma wording influenced responses. Both the question manipulation, the person manipulation, and the interaction significantly affected rates of utilitarian responses. Thus the research hypothesis was validated.

Condition A: second person, would.

The first manipulation reveals equivalent levels of utilitarian responses for the two moral dilemma types (Personal $M = 5.47$, Impersonal $M = 5.06$), with non moral responses elevated in comparison ($M = 6.37$), (see Figure 1). The similar responses to moral dilemmas may rely on the personal nature elicited by the second person / would condition wording. This possibly represents similar moral decision making methods for personal and impersonal moral dilemmas in Condition A.

Condition B: second person, should.

The second condition also reveals equivalent, though slightly varied, utilitarian responses. The personal utilitarian rate ($M = 5.91$) was somewhat higher than the impersonal utilitarian responses ($M = 5.15$) (see Figure 1). This condition revealed non-moral responses also equivalent to the moral ones ($M = 5.97$). These results, along with Condition A's results, demonstrate a similarity between the utilitarian responses for all second person conditions.

Personal Moral responses varied by .44 while impersonal moral responses varied by .09 between Conditions A and B. This result may show similar or even equal moral decision making methods for all second person conditions.

Condition C: third person, would.

The third manipulation reveals high overall utilitarian responses compared with the other conditions, with personal moral responses at $M = 6.61$, and impersonal moral responses at $M = 6.84$ (See Figure 1). Non moral responses ($M = 6.19$), continued to conform to the results for the four other conditions. Here the overall elevated moral utilitarian response suggests that participants expect others to make highly utilitarian moral decisions.

Condition D: third person, should.

The fourth condition reveals personal utilitarian responses much higher ($M = 6.27$) than the the impersonal moral responses ($M = 5.09$) (See Figure 1). For the fourth time, non moral responses are shown to be equivalent to other conditions ($M = 5.79$). The split between personal and impersonal responses in this condition may be due to the nature of the third person, should condition. The data may show that we believe others will use utilitarian methods to make impersonal dilemma decisions, but that the others will use decision making closer to those employed in the second person conditions.

It is also important to mark the distinction between overall moral responses in the two should conditions. While high ratings for the personal moral responses may reveal our belief that others will make highly utilitarian decisions in those dilemmas, the impersonal distinction may reveal markedly different decision making strategies for would vs. should questions in impersonal moral dilemmas. One possible explanation is that participants believe personal actions (what one would do) differ from ideal actions (what one should do

The data suggest that wording triggers us to use different decision making methods. This was demonstrated by the interaction effect, which showed significant differences in overall utilitarian responses for each of the four question and person manipulations. Despite the success of this study in finding results, research like this can only provide statistics based on responses to broad questions. What these studies cannot tell us is what people are thinking while they make moral decisions. This study alone is not sufficient to show that wording causes moral dilemmas to be solved through different neural processes. A follow-up fMRI study may illuminate these processes more clearly.

One observation from the debriefing sessions with each participant is that many individuals could not recall their assigned condition after the task. This was a general observation from debriefing sessions and not recorded. Participants were told about the four conditions, and then asked if they recalled which one they were in. Interestingly, many participants explained that they did not recall their condition. Many participants cited Condition A even if they had actually been in another condition, which they often were. Unfortunately this observation was not an item on the demographic information sheet, and was thus not recorded. However, the possibility that participants did not have the conditional wording in mind while making moral decisions suggests two things. First, participants may have been unconsciously influenced by the wording manipulation. Second, participants may have ignored the wording altogether and decided with the same processes that they would have used in Condition A: second person / would. In other words, participants may have responded to all moral dilemmas with the decision making methods for themselves.

This research study does demonstrate that morals can be manipulated by our perception of moral situations. If this process translates to moral judgment in the real world, these results

are profound. For example, when lawyers are presenting cases to a jury, their wording of the case might influence the jury decisions. As well, the way that our media represents information to us about national and world issues may also influence our opinions of what is morally acceptable. Therefore, it is important to keep in mind the influence of wording and context on the variety of moral judgments that we encounter in our lives. Our culture emphasizes the key to acting morally as a possession of strong moral beliefs. Yet this study suggests that our decisions are very strongly influenced by our first impression of a moral situation. If this is so, our teachings about morality are flawed. If we are to act morally we should teach ourselves to reevaluate moral situations to see them from all aspects. From there we can choose the best way to perceive moral situations, and then act according to our moral beliefs. As this moral decision study shows, our morality is meaningless if we are on its wrong side.

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Appendices

Appendix A

Scenarios

Non-Moral Scenarios:

1. Standard Turnips

You are a farm worker driving a turnip-harvesting machine. You are approaching two diverging paths.

By choosing the path on the left you will harvest ten bushels of turnips. By choosing the path on the right you will harvest twenty bushels of turnips. If you do nothing your turnip-harvesting machine will turn to the left

Would you turn your turnip-picking machine to the right in order to harvest twenty bushels of turnips instead of ten?

2. Plant Transport

You are bringing home a number of plants from a store that is about two miles from your home. The trunk of your car, which you've lined with plastic to catch the mud from the plants, will hold most of the plants you've purchased.

You could bring all the plants home in one trip, but this would require putting some of the plants in the back seat as well as in the trunk. By putting some of the plants in the back seat you will ruin your fine leather upholstery which would cost thousands of dollars to replace.

Would you make two trips home in order to avoid ruining the upholstery of your car?

3. Generic Brand

You have a headache. You go to the pharmacy with the intention of buying a particular name-brand headache medicine. When you get there you discover that the pharmacy is out of the brand you were looking for.

The pharmacist, whom you've known for a long time and in whom you have a great deal of trust, tells you that he has in stock a generic product which is, in his words, "exactly the same" as the product you had originally intended to buy.

Would you purchase the generic brand instead of searching further for the name-brand product you were looking for?

4. Brownies

You have decided to make a batch of brownies for yourself. You open your recipe book and find a recipe for brownies.

The recipe calls for a cup of chopped walnuts. You don't like walnuts, but you do like macadamia nuts. As it happens, you have both kinds of nuts available to you.

Would you substitute macadamia nuts for walnuts in order to avoid eating walnuts?

5. Train or Bus

You need to travel from New York to Boston in order to attend a meeting that starts at

2:00 PM. You can take either the train or the bus.

The train will get you there just in time for your meeting no matter what. The bus is scheduled to arrive an hour before your meeting, but the bus is occasionally several hours late because of traffic. It would be nice to have an extra hour before the meeting, but you cannot afford to be late.

Would you take the train instead of the bus in order to ensure your not being late for your meeting?

6. Survey

A representative of a reputable, national survey organization calls you at your home while you are having a quiet dinner by yourself.

The representative explains that if you are willing to spend a half an hour answering questions about a variety of topics her organization will send you a check for \$200.

Would you interrupt your dinner in order to earn \$200?

7. Investment Offer

You are at home one day when the mail arrives. You receive a letter from a reputable corporation that provides financial services. They have invited you to invest in a mutual fund, beginning with an initial investment of one thousand dollars.

As it happens, you are familiar with this particular mutual fund. It has not performed very well over the past few years, and, based on what you know, there is no reason to think that it will perform any better in the future.

Would you invest a thousand dollars in this mutual fund in order to make money?

8. Raffle

You've decided to buy a raffle ticket to support a local charity. They are separately raffling off two different cars: Car A and Car B. You have decided to buy one raffle ticket. You are a serious and knowledgeable car enthusiast, and you think that these two cars are equally good.

Because there have been a lot of ads for Car B on TV recently, many more people have chosen to buy tickets for the Car B raffle. Since more people have bought tickets for the Car B raffle, your chances of winning are better in the Car A raffle than in the Car B raffle.

Would you buy a ticket for the Car B raffle in order to win a car?

9. Jogging

You intend to accomplish two things this afternoon: going for a jog and doing some paperwork. In general you prefer to get your work done before you exercise.

The weather is nice at the moment, but the weather forecast says that in a couple of hours it will start to rain. You very much dislike jogging in the rain, but you don't care what the weather is like while you do paperwork.

Would you do your paperwork now with the intention of jogging in a couple of hours in order to get your work done before you exercise?

10. Food Prep

You are preparing pasta with fresh vegetables, and you are deciding on the order in which

you will do the various things you need to do. You are in a big hurry.

At the moment you have a slight urge to cut vegetables. If you first start the water boiling and then cut the vegetables you will be done in twenty minutes. If you cut the vegetables and then start the water boiling you will be done in forty minutes.

Would you cut the vegetables first and then start the water boiling in order to satisfy your slight urge to cut vegetables?

Impersonal Moral Scenarios:

1. Standard Trolley

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.

Would you hit the switch in order to avoid the deaths of the five workmen?

2. Standard Fumes

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.

Would you hit the switch in order to avoid the deaths of the three patients?

3. Vaccine Policy

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.

Would you direct your agency to encourage the use of this vaccine in order to promote national health?

4. Sculpture

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. Would you destroy the sculpture in order to save this workman's life?

5. Speedboat

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.

Would you borrow the speedboat in order to warn the tourists about the storm?

6. Resume

You have been trying to find a job lately without much success. You figure that you would be more likely to get hired if you had a more impressive resume.

You could put some false information on your resume in order to make it more impressive. By doing this you might ultimately manage to get hired, beating out several candidates who are actually more qualified than you.

Would you put false information on your resume in order to help yourself find employment?

7. Taxes

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.

Would you pretend that certain personal expenses are business expenses in order to lower your taxes?

8. Stock Tip

You are a management consultant working on a case for a large corporate client. You have access to confidential information that would be very useful to investors. You have a friend who plays the stock market. You owe this friend a sizable sum of money.

By providing her with certain confidential information you could help her make a lot of money, considerably more than you owe her. If you did this, she would insist on canceling your debt. Releasing information in this way is strictly forbidden by federal law.

Would you release this information to your friend so that she will cancel your debt?

9. Illegal Lunch

You are a lawyer working on a big case. The judge presiding over the trial happens to be

someone you knew from law school. The two of you were rather friendly back then, but now, decades later, it seems that your old friend barely remembers you.

You're quite sure that if you were to talk to him over lunch, you could jog his memory and he would begin to see you as an old buddy, which would be very good for your work on this case. It's illegal for judges and lawyers working on the same case to meet socially.

Would you meet with this judge socially in order to help you win your case?

10. Lost Wallet

You are walking down the street when you come across a wallet lying on the ground. You open the wallet and find that it contains several hundred dollars in cash as well the owner's driver's license.

From the credit cards and other items in the wallet it's very clear that the wallet's owner is wealthy. You, on the other hand, have been hit by hard times recently and could really use some extra money. You consider sending the wallet back to the owner without the cash, keeping the cash for yourself.

Would you keep the money you found in the wallet in order to have more money for yourself?

Personal Moral Scenarios:

1. Footbridge

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.

Would you push the stranger on to the tracks in order to save the five workmen?

2. Crying Baby

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.

Would you smother your child in order to save yourself and the other townspeople?

3. Lifeboat 2

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. If nothing is done it will sink before the rescue boats arrive and everyone on board will die. However, there is an injured person who will not survive in any case. If you throw that person overboard the boat will stay afloat and the remaining passengers will be saved.

Would you throw this person overboard in order to save the lives of the remaining passengers?

4. Preventing the Spread 2

You are a waiter. You overhear one of your customers say that he is about to go to jail and that in his last forty-eight hours of freedom he plans to infect as many people as possible with HIV. You know him well enough to know that he is telling the truth and that he has access to many potential victims.

You happen to know that he has a very strong allergy to poppy seeds. If he eats even one he will go into convulsions and have to be hospitalized. for at least forty-eight hours.

Would you cause this man to have a serious allergy attack in order to prevent him from spreading HIV?

5. Ecologists

You are part of a group of ecologists who live in a remote stretch of jungle. The entire group, which includes eight children, has been taken hostage by a group of paramilitary terrorists. 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 is willing to help you and the children escape, but as an act of good faith he wants you to kill one of your fellow hostages whom he does not like. If you refuse his offer all the hostages including the children and yourself will die. If you accept his offer then the others will die in the morning but you and the eight children will escape.

Would you kill one of your fellow hostages in order to escape from the terrorists and save the lives of the eight children?

6. Submarine

You are the captain of a military submarine travelling underneath a large iceberg. An onboard explosion has caused you to lose most of your oxygen supply and has injured one of your crew who is quickly losing blood. The injured crew member is going to die from his wounds no matter what happens.

The remaining oxygen is not sufficient for the entire crew to make it to the surface. The only way to save the other crew members is to shoot dead the injured crew member so that there will be just enough oxygen for the rest of the crew to survive.

Would you kill the fatally injured crew member in order to save the lives of the remaining crew members?

7. Lawrence of Arabia

You are the leader of a small army that consists of warriors from two tribes, the hill tribe and the river tribe. You belong to neither tribe. During the night a hill tribesman got into an argument with a river tribesman and murdered him. The river tribe will attack the hill

tribe unless the murderer is put to death, but the hill tribe refuses to kill one of its own warriors.

The only way for you to avoid a war between the two tribes that will cost hundreds of lives is to publicly execute the murderer by cutting off his head with your sword.

Would you cut off this man's head in order to prevent the two tribes from fighting a war that will cost hundreds of lives?

8. Sophie's Choice

It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy's headquarters is a doctor who performs painful experiments on humans that inevitably lead to death.

He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them.

Would you bring one of your children to the laboratory in order to avoid having them both die?

9. Vaccine Test

A viral epidemic has spread across the globe killing millions of people. You have developed two substances in your home laboratory. You know that one of them is a vaccine, but you don't know which one. You also know that the other one is deadly. Once you figure out which substance is the vaccine you can use it to save millions of lives. You have with you two people who are under your care, and the only way to identify the vaccine is to inject each of these people with one of the two substances. One person will live, the other will die, and you will be able to start saving lives with your vaccine.

Would you kill one of these people with a deadly injection in order to identify a vaccine that will save millions of lives?

10. Euthanasia

You are the leader of a small group of soldiers. You are on your way back from a completed mission deep in enemy territory when one of your men has stepped in a trap that has been set by the enemy and is badly injured. The trap is connected to a radio device that by now has alerted the enemy to your presence. They will soon be on their way.

If the enemy finds your injured man they will torture him and kill him. He begs you not to leave him behind, but if you try to take him with you your entire group will be captured. The only way to prevent this injured soldier from being tortured is to shoot him yourself.

Would you shoot this soldier in order to prevent him from being tortured by the enemy?

Appendix B

Informed Consent

Influences on Moral Decision-Making

Introduction

You are being invited to take part in a research study. The information in this form is provided to help you decide whether or not to participate. Study personnel will be available to answer your questions and provide additional information. If you decide to take part in the study, you will be asked to sign this consent form. A copy of this form will be given to you.

What is the purpose of this research study?

You are being invited to participate voluntarily in the above-titled research project. The purpose of this project is to gain a better understanding of the mental processes involved in how people make judgments and decisions about moral judgments. There are no alternate treatments since this is not a treatment study.

Why are you being asked to participate?

You are being invited to participate because you are age 18 or over, and speak and read English fluently. You are living independently in the community without difficulty in daily activities due to memory or thinking problems.

How many people will be asked to participate in this study?

Approximately 150 persons will be asked to participate in this study.

What will happen during this study?

If you agree to participate, you will be asked to consent to some or all of the following:

- You will be asked to make judgments about several dilemmas. For example, you may be asked whether you would let one person die in order to save the lives of five others.

How long will I be in this study?

Approximately one hour will be needed to complete this study.

Are there any risks to me?

The things that you will be doing involve no significant risks. Although we have tried to avoid risks, there is the possibility of some minor muscle discomfort or eye-strain due to sitting at the computer for the duration of the experiment.

Are there any benefits to me?

You will not receive any benefit from taking part in this study. The investigators may learn more about the thought processes that underlie how decisions are made, which may in turn promote better understanding of how the human brain is organized and functions.

Will there be any costs to me?

Aside from your time, there are no costs for taking part in the study.

Will I be paid to participate in the study?

If you are a student taking a psychology course requiring experimental participation, you will receive 2 credits of research credit.

If you are participating as a result of responding to a campus flyer, you will receive \$8 for your participation today.

Will video or audio recordings be made of me during the study?

No.

Will the information that is obtained from me be kept confidential?

The only persons who will know that you participated in this study will be the investigators in this project and persons directly employed in the laboratory.

Your records will be kept confidential. You will not be identified in any reports or publications resulting from the study. It is possible that representatives of the Federal Government or Human Subjects Protection Program that supports the research study will want to come to the University of Arizona to review your information. If that occurs, a copy of the information may be provided to them but your name will be removed before the information is released.

May I change my mind about participating?

Your participation in this study is voluntary. You may decide to not begin or to stop the study at any time. Your refusing to participate will have no effect on your student status. You can discontinue your participation with no effect on your student status. Also any new information discovered about the research will be provided to you. This information could affect your willingness to continue your participation.

Whom can I contact for additional information?

You can obtain further information about the research or voice concerns or complaints about the research by calling the Principal Investigator Erienne Weine, at (520) 621-9306 or Dr. Alan Sanfey, Ph.D. at (520) 621-1477. If you have questions concerning your rights as a research participant, have general questions, concerns or complaints or would like to give input about the research and can't reach the research team, or want to talk to someone other than the research team, you may call the University of Arizona Human Subjects Protection Program office at (520) 626-6721. (If out of state use the toll-free number 1-866-278-1455.) If you would like to contact the Human Subjects Protection Program on the web please use the following link: www.irb.arizona.edu/contact/

Your Signature

By signing this form, I affirm that I have read the information contained in the form, that the study has been explained to me, that my questions have been answered and that I agree to take part in this study. I do not give up any of my legal rights by signing this form.

Name (Printed)

Participant's Signature

Date signed

Statement by person obtaining consent

I certify that I have explained the research study to the person who has agreed to participate, and that he or she has been informed of the purpose, the procedures, the possible risks and potential benefits associated with participation in this study. Any questions raised have been answered to the participant's satisfaction.

Name of study personnel

Study personnel Signature

Date signed