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Using the Trolley Dilemma and the Implications of Anxiety to Look at How Interpersonal Relationships Impact Moral Decision-Making

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Using the Trolley Dilemma and the Implications of Anxiety to Look at How Interpersonal
Relationships Impact Moral Decision-Making

Senior Project Submitted to
The Division of Science, Math, and Computing
of Bard College

by
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Table of Contents

ABSTRACT	1
INTRODUCTION	2
Interpersonal Relationships and Decision-Making	3
Morality	4
Intersection Between Interpersonal Relationships and Morality	7
Trolley Dilemma	8
Mental Illness, Morality, and the Trolley Dilemma	10
Moral Philosophies and Anxiety	11
Attachment Styles and Decision-Making	12
METHODS	13
Participants	13
Power and Effect Size Considerations	17
Procedure	18
Materials	19
RESULTS	22
Primary Analyses	22
Exploratory Analyses	25
DISCUSSION	26
Interpersonal Relationships on Decision-Making	26
Anxiety on Decision-Making	26
Limitations and Future Research	27
Conclusions	29

REFERENCES

APPENDICES

Appendix A: Institutional Review Board Approval

Appendix B: Vignette Variants Used in Participant Survey

Appendix C: Participant Consent Form

Appendix D: Participant Demographic Questionnaire

Appendix E: Significant Other Information Collector

Appendix F: GAD-7 Questionnaire

Appendix G: Debriefing Form

Appendix H: Experiment Preregistration

Abstract

Personal connections that are established with interpersonal relationships have an impact on moral decision-making. This concept will be tested when considering the trolley dilemma archetype. The trolley dilemma presents a situation where an individual is prompted to choose between a series of options that will save one party yet cause the death or injury of another. The present study will use the trolley dilemma to test whether participants are more likely to make a prosocial decision than a self-serving decision when put in a predicament that forces them to choose between their interests and the greater good of society. To conclude, this study will prompt a pool of online participants to give names of people with whom they have specified personal relationships. Following this, the survey will prompt the participants to interact with a series of curated trolley dilemmas that utilize their interpersonal relationships compared to strangers when measuring their response to close relationships versus situations involving strangers. Results will measure the effect that interpersonal relationships have on individuals when they are making moral decisions. This study hypothesizes that prosocial or selfish choices will be impacted by whether the persons in the dilemma are of significant personal value to the participant. Participants in differing populations, i.e., child versus adult, may be more drawn to saving certain groups. This aspect will also be measured regarding the condition's significance to the participants when choosing who should live in the trolley dilemma. Additionally, these results will consider anxiety's effect on the decision-making process. This will be done by collecting GAD-7 results and relating them to the collected data.

Keywords: trolley dilemma, moral decisions, anxiety, utilitarianism, interpersonal relationships, morality, selfish, deontological

Using the Trolley Dilemma and the Implications of Anxiety to Look at How Interpersonal Relationships Impact Moral Decision-Making

Individual factors in the decision-making process account for each person's unique rationalization regarding what they would do in a given situation. One of these factors is interpersonal relationships (IRs). In the general context of the decision-making process, an IR may impact the decision-making practice due to the relationship between the individual making the decision and the individual participating in the dilemma. For example, suppose a decision needs to be made by a mother in which the decision will impact the mother's child; having an established personal connection to the person involved in the scenario makes it so that there is a bias in the decision being made. In that case, an individual factor will likely impact the decision. Therefore, the mother's decision may be self-serving in relation to her child. This decision entertaining a hypothetical, which can consider the scenario of a mother having to choose between sacrificing her baby to save five strangers, can be manipulated in various ways, which may change the final decision. For example, what if the mother had to choose between sacrificing her child or saving an older adult, sacrificing her child or saving five random children, or sacrificing her child or saving fifty other people? These are all questions entertained by the critical factor of an IR involved in the tough decision. Whether that personal connection is positive or hateful, it will have a resounding effect on the reasoning behind the decision.

Another factor that is focused on in this study that may impact a person's decision-making is their anxiety levels, and how anxious an individual is can influence the decision that is being made. Will the individual be too anxious to commit to any decision and refuse to make one altogether? Or will they have specific anxieties regarding losing someone who is a big part of their world versus the anxiety that may come with choosing to sacrifice a

more significant number of individuals to make their lives easier by not choosing to kill someone with whom they share a personal connection? Emotions may impact many facets of our lives, and emotions can very well impact decision-making; this study will focus on anxiety in particular.

Being a ‘moral’ person, or being in moral good standing, is a characteristic that is praised by society. On the other hand, making a decision that harms a person that one cares about may cause some discomfort, which may result in decision-making that, instead of prioritizing the well-being of the majority, focuses on the well-being of those with whom we have a significant personal connection. How much does this outward presentation of a person matter to them when it concerns saving or sacrificing a loved one? Or, how much does something as personal as a significant other or a family member matter to the individual when presented with the scenario of sacrificing their lives for others? The factors of IRs and anxiety may affect the decision-making processes that one goes through preceding standing by a decision.

Interpersonal Relationships and Decision-Making

What happens when IRs and decision-making are tested against each other in competitions of importance? Is any random individual more likely to choose between saving a singular person they know over someone who is a stranger to them? Or an assortment of strangers? Or would they choose the third option of not deciding at all? The famous trolley dilemma presents whether an individual would save one person, kill five, or sacrifice one life to save five. In this study, the question is substituting the ‘one person’ portion of the scenario with someone of personal significance to the person responsible for making the moral decision, rather than just ‘a’ person or a stranger.

A prosocial decision refers to making a choice based on the idea that one should do what is suitable for the betterment of society and not just one's self. This can also be thought of as the common saying 'look at the bigger picture' - to look beyond one's relation to the current event and decide based on what would be 'objectively correct.' In the context of the trolley dilemma, this would mean that a prosocial person would see the issue not as choosing between saving the person with whom they have an IR and five random strangers but instead as saving one person or saving five. Will they choose the prosocial decision by sacrificing a significant other or make the more 'biased' decision and sacrifice five lives to save the person they care about?

This study hypothesizes that positive IRs affect moral decision-making because they will cause the participant to choose the selfish decision of saving their significant other in the trolley dilemma. The study incorporates a moderate number of strangers (between one to five strangers) rather than potentially overwhelming the participant by utilizing a number in the hundreds or thousands. It is also hypothesized that mental health, specifically anxiety, may impact decision-making at the time of working through the moral dilemma, effectively impacting the decision that the participant chooses to make. The decision may be determined by the individual's current state of mental health by changing the reasoning that goes into deciding to make the prosocial decision, the selfish decision, or even choosing to omit their decision entirely.

Morality

Morality is the distinction between what is considered to be correct and wrong. Making a moral decision or seeing the line between good and evil is simple. There is an enormous complexity that comes with the concept of morals, as there are various moral philosophies, and depending on which philosophy is being utilized, the "right" answer changes. Even within each

moral philosophy, moral dilemmas exist, which can make seeing what may be a clear answer tricky, for example, when making a moral decision regarding something personal to them, something that has an emotional charge (Martins, 2022). There are moral situations that may seem straightforward but can easily have additions to the moral dilemma that can instantly make it more challenging to solve, such as adding an unfavorable twist to a dilemma to make it more complicated to conclude.

The moral options that would make us look good when faced with moral dilemmas are those that are most prosocial, positively impact the maximum number of people, and the decision that is ultimately responsible for doing the most good (Prestwich et al., 2023). Researchers propose that traits linked to being well-respected and liked are associated with being moral (Prestwich et al., 2023). Individuals rated “moral” are likelier to possess other praised traits such as competence, assertiveness, and warmth (Prestwich et al., 2023). This shows a correlation between being a morally good person and having other positive traits. This suggests that making a decision that is considered ethically sound by societal standards has additional positive byproducts, resulting in a society providing an individual who has made the proper moral decision with positive praise. This situation, however, is utilizing the correct moral decision that is defined on a societal level, which, considering the trolley dilemma, would be defined as the choice that includes saving the maximum number of lives. On a personal level, the correct moral decision may be revealed as keeping the person with the most personal significance to the individual in charge.

Judith Thompson adequately discusses morality regarding being complacent to the action that causes harm and enacting the action that causes the damage. That is to say, the difference between directly committing an action versus being a bystander who fails to intervene and,

therefore, prevent an action (Thompson, 1976). Thompson's writing poses an intriguing question: Is letting someone die and killing someone comparable to each other? Can we perceive the intent behind these two scenarios as being the same? She discusses how many people believe that it is better to let someone die rather than be the one who kills them and draws this conclusion to how it may transfer to practical, real-world scenarios. The scenarios that she brings up are mainly rooted in the medical field, such as abortions, euthanasia, and situations that regard the distribution of scarce resources. Thompson discusses how specific actions that seem insignificant (i.e., punching someone in the face) can have a significant impact when we have insight into the consequences and context of the situation. In one of the examples that she describes, there is a man who has a peculiar condition in which if he is punched in the face, it causes him to die. On the other hand, there is a man whose wife wants him to die, so she cuts off his head, leading to his death. The wife of the man with the peculiar condition punches him in the nose because she wants him to die. In this scenario, it can be said that these two are comparable actions because they both cause the same event: the death of their husband.

With this in mind, Thompson makes the argument, based on Phillipa Foot's trolley dilemma, that according to what is considered to be correct and wrong by the general population, one should not kill one person to save one and should not even kill one person if the stakes were more intense, such as, to save five people. Based on Foot's writing, she suggests that we have "negative duties" and "positive duties," so we should not participate in negative actions, and killing, even to save people, is an adverse action. Doing wrong for the right reasons is not appropriate in these situations.

However, she points out that in the trolley dilemma, the driver will participate in a "negative duty" either way, whether he stays on the same track or switches to another track. In

this situation, he is forced to take action because, in any conclusion to the scenario, he will be responsible for a person's (or people's) deaths. In this situation where the driver is faced with two negative duties, Thompson states that it should not be a conflicting decision and that the driver must choose the lesser evil, killing one person to save five. Thompson continues to discuss different scenarios in which morality is stressed in various dilemmas. Her writing suggests that there is a lot to be said about morality and that the power of the situation is crucial when deciding what should be considered just and what should be considered morally wrong. The power of the situation in these scenarios includes the intentions of the individuals involved in the dilemma, the information they have about the issue when making their decision, and their impact on those involved.

Intersection Between Interpersonal Relationships and Morality

Relationships between individuals impact decision-making around moral questions. When one person has a personal connection - affiliation or an IR - to another person, this can complicate decisions because of the accumulated bias towards one individual. As the results from Zhan et al., 2018 and Navarrete et al., 2012 have suggested, the person in charge of the decision-making may be biased in favor of someone with whom they have an IR. This bias may encourage the individual to favor a less prosocial outcome, as they are more concerned with not putting the person they have the IR in an undesirable situation.

In a 2018 experiment, IRs and morality were studied using thirty moral dilemmas based on real-life situations (Zhan et al.). The researchers focused on different types of IRs, including friendships. The study concluded that IRs have an impact on both behavioral and neural responses that are used during moral decision-making, meaning that the more personally significant the IR was to the participant, the more efficiently the ethical dilemma was solved

when compared to a stranger condition (Zhan et al., 2018). The study considered viewing real-life situations with presentations of different intimacy levels of IR and how this affects behavioral and neural responses through EEGs and intentionally worded and timed dilemmas.

Trolley Dilemma

In the example of the classic trolley dilemma, introduced by Philippa Foot in 1967, there is a formulation of some hypothetical situation that involves saving either one person and killing five or killing one person and saving five (Foot, 1967). Foot contrasts the trolley dilemma, where people tend to choose to save five people and kill one, with the surgeon's dilemma. In the surgeon's dilemma, five people require specific organs to go through life-saving surgeries. There is a healthy man who comes into his office and has the appropriate blood type and the healthy organs that could save the five dying patients, but the man refuses to give his life up to save the five patients (Foot, 1967). The question that Phillipa then proposes is: Should the surgeon decide to put the man under the knife regardless of his refusal to save five lives? Or should he accept this man's wishes and let the five sick patients die? These are two similar dilemmas where there is a choice to be made that will either kill five people or kill one person, yet the situation in which the question is asked changes the morality of the problem. This is a prevalent dilemma that has been studied and trialed in different variations, changing different details of the predicament to gain data on various psychological questions that can be derived from a single problem.

An emotionally charged situation would change things slightly by adding a personal relation to the person in charge of the moral decision. For example, if the trolley hits the individual, it is someone important to them. This makes things more complicated for the

individual in this situation because although the answer to the moral dilemma initially seemed obvious, it no longer does once the emotionally charged subject is added.

In a study conducted in 2010 by Bleske-Rechek et al., the one-person condition in the trolley dilemma was manipulated, leading to different results in the participant's choices of whether they would save the five people or the one person. The differing characteristics of one person would be altered based on the relatedness to the participant, romantic involvement, and the hypothetical individual's age (Bleske-Rechek et al., 2010). This study yielded exciting results, as the participants were unwilling to sacrifice a reproductive partner or family member even if it meant saving five lives (Bleske-Rechek et al., 2010). Intimacy, whether it be romantic or familial, has an impact on the moral choice that an individual makes. As suggested by the study by Bleske-Rechek et al. (2010), this may lead to a less prosocial choice if the individual is asked to sacrifice the individual with whom they have an established IR. This shows that IRs impact the decision-making process experienced when attempting to solve a dilemma, considering that the moral dilemma involves an individual of personal interest. These results also suggest that it may be easier for an individual to make a more sound prosocial decision if all the parties involved are strangers compared to if one of the parties was a family member, acquaintance, or possible reproductive partner.

In a research study conducted by Navarrete et al. in 2012, a virtual-reality simulation was used to delve deeper into the emotions and actions that occur during the establishment of a moral decision, in this case, a virtual version of the trolley dilemma. Through virtual reality, the authors believed they could receive a response closer to what would be observed in a real-world dilemma than merely making a declarative response (Navarrete et al. 2012). Immersing the participants in the trolley experience could provide a more realistic scenario than having the participants fill out

a questionnaire or respond to a vignette. This approach could get more accurate data because the individual has an experience, although virtual, and we can extract their timely reaction instead of prompting them and asking them how they may react in a given predicament. The study included 293 participants who took part in the virtual reality trolley dilemma (without knowing that it was a moral dilemma) and were studied on their autonomic arousal during the procedure (Navarrete et al., 2012).

Mental Illness, Morality, and the Trolley Dilemma

A mental illness diagnosis can impact a subject's response to the trolley problem. Some research studies have incorporated an additional layer to their experiments by measuring a construct in addition to morality and the trolley dilemma. In 2015, Mancini and Gangemi conducted a study that focused on obsessive-compulsive disorder (OCD) and how this may inspire deontological¹ guilt when approaching morals and, more specifically, the trolley dilemma (2015). This study suggests that individuals who have obsessive-compulsive disorder, also known as OCD, where a person experiences recurrent and persistent thoughts or compulsions or both, are more likely to opt for the deontological approach in dealing with the trolley problem, meaning that their OCD symptoms put them at a higher likelihood of choosing to omit their decision rather than choosing whom to save. By omitting their decision, they decided not to take responsibility for the situation and let the train go whichever way it was already going.

¹A moral philosophy which focuses on whether the action is considered to be moral or immoral, rather than focusing on the consequences that may come as a result of these decisions. In this study, it can be applied in the sense that choosing to kill someone is wrong. If an individual approaches morality in a deontological way, the morally sound decision for the trolley dilemma would be to avoid making a decision, as either decision they make would be killing someone, and that is the focus of the morals. Doing a smaller amount of harm for the greater good does not apply in deontological theories. This means that even though killing one person saves one hundred people, it is immoral to kill that one person, simply because it is immoral to kill.

Moral Philosophies and Anxiety

There is a wide range of moral philosophies. Two moral philosophies which relate to the trolley dilemma are deontology and utilitarianism. The deontological moral framework posits that people should be more dedicated to doing what is right rather than doing what is considered good (Larry, 2007). For a situation with emotional charge, a person making a moral decision may lean towards the not-so-prosocial decision and choose a more selfish option. However, a clear prosocial moral decision may be made for an uninvolved onlooker. The decision that will make a person feel as though their decision is morally justifiable depends on which moral philosophy they follow. The critical difference between deontology and utilitarianism is that in a deontological philosophy, there is a belief that morality depends on the consistency of the believed moral norms. In contrast, in a utilitarian philosophy, the focus is on the morally justifiable outcome. The former focuses on the perceived ethically correct choice in the context of societal normalities, and the latter focuses on which of the choices causes a more morally preferable outcome. In the trolley dilemma, a utilitarian would look at the outcome that would lead to the least harm caused, which would be the second option. At the same time, a deontologist would stick with being consistent with their moral norms, which does not consider the consequences of their actions.

In a study conducted by Robinson et al. in 2015, it was found that individuals with avoidant and anxious attachment styles² lead to a line of decision-making that often results in more utilitarian choices. In the study by Robinson et al. (2015), it is speculated that these attachment styles lead to utilitarian decision-making because they increase concern for the group and decrease when it regards empathic concerns. However, a study conducted by Maranges et al.

² Theories regarding relationships between humans based on psychological, evolutionary and ethological perspectives.

in 2021 suggests that individuals who have avoidant attachment styles are found to be more deontological in their moral decision-making and less utilitarian, which conflicts with the results that were found in Robinsons et al., 2015. This means that those with avoidant attachment styles are more likely to choose the course of action that focuses on their intentions when making the decision rather than attempting to save the most significant number of people. This means that in the trolley dilemma, they are more likely to refuse to decide because they do not believe in killing people, so they will choose not to kill, no matter what the consequences are. The question that is encouraged from this study is: Do individuals who have higher levels of anxiety have a higher chance of possessing deontological perspectives, specifically when it concerns solving moral dilemmas?

Attachment Styles and Decision-Making

Attachment styles may predict different roles in the decision-making processes credibly, such as “decision self-esteem, decision-making styles, and personality traits” (Deniz, 2011). In his research paper, Deniz goes on to express the importance of the relationship that is brought on in early childhood between the child and their primary caregiver. He explains that the attachment style is molded through these initial emotional interactions. The type of attachment style is connected directly to the individual's view of themselves and others. There are four attachment styles: secure, preoccupied, dismissing, and avoidant. The secure attachment style is reflected by the individual possessing a positive view of themselves (inward) and those around them (outward). In contrast, the preoccupied attachment style is focused on the negative inward reflection and view of themselves while possessing a positive view of those around them. A dismissive attachment style refers to the individual having “a positive self model³, but a negative

³ self model, referring to a person's self image

model of others and giving excessive importance to independence,” while a fearful attachment style refers to negative feelings that are aimed inwards and outwards, and the self and others (Deniz, 2011).

These attachment styles each portray varying levels of confidence in the self or others, which will impact decision-making processes. The influence of each attachment style on decision-making differs due to the levels of confidence in the self and in others across the four styles.

Methods

Participants

Fifty-four participants were recruited on Prolific, a website that recruits eligible individuals for online studies. The participants ranged from ages 19-77 years old. The eligibility criteria for participating in the study were being above 18 and being able to communicate fluently in English. In the demographic questionnaire, data regarding the gender identity and race/ethnicity of participants was also collected. Participants received compensation of twelve dollars per hour for a survey that took approximately eighteen minutes to complete, resulting in the participants averaging a compensation of three dollars and sixty cents. Participants were excluded if they were under the age of 18 and if their primary language was not English.

Participants received a randomly selected condition through a Qualtrics⁴ randomizer tool responsible for the dilemma archetype they would be presented with. The three condition options were: predetermined stranger condition ($n = 37$), the name of a significant other or a romantic interest ($n = 45$), or a close family member ($n = 42$). The information collected with the

⁴Qualtrics is an online survey tool that assists with survey creation and participant recruitment for studies.

Significant Other Information Collector questionnaire was plugged in through a Qualtrics tool in the latter two conditions. These conditions determined the dilemma structure they were presented with. If assigned to the stranger condition, they would choose between saving a stranger or multiple strangers (or in the stranger condition in the third vignette, between saving the same number of adult and child strangers).

Additionally, vignette number three is also the singular vignette that prompts the participant to choose between saving an equal number of lives (i.e., three children and three adults both from stranger conditions, rather than saving two adults versus one child or vice versa), as they are typically prompted to save their IR in exchange for multiple lives, which puts a heavy emphasis on how significant the participant believes their IR weighs out to be. If they were randomly assigned to the significant other condition, the name of their significant other or family member would be plugged into the vignette, and they would be prompted to choose between saving their significant other or multiple strangers. The participants had three options: they could choose between saving the strangers or their significant other/family member, saving one stranger versus multiple strangers, and an equal quantity of adult strangers versus children strangers.

Demographics

Gender

Given the results of the gender self-identification question, 19 (37%) of participants identified as male, 30 (58%) identified as female, and 3 (6%) identified as non-binary or other. Zero (0%) of participants declined to answer the question.

Figure 1*Participant Demographics - Gender*

Which gender do you identify with?	Percentages of responses	Count
Male	36%	19
Female	58%	30
Non-Binary/Other	6%	3
I prefer not to say	0	0

Regarding gender demographics, 37% identified as male, 58% as female, and 6% as non-binary. This data shows that more participants identified as female than male or non-binary.

Race and Ethnicity

Figure 2

Participant Demographics - Ethnicity

What category/categories best describe you? Select all that apply.	Percentage	Count
American Indian or Alaskan Native	2%	1
Asian	10%	5
Black or African American	13%	7
Hispanic, Latinx, or Spanish Origin	10%	5
Middle Eastern or North African	0%	0
Native Hawaiian or Other Pacific Islander	0%	0
White	75%	39

The race and ethnicity portion of the questionnaire shows that the majority of the collected sample population identified as being White (75%), the second most concentrated group was Black or African American (13%), and then Asian and Hispanic, Latinx, or Spanish Origin (tied at 10%)—finally, 2% of participants identified as being American Indian or Alaskan Native.

Exclusion criteria included participants under 18 years old, not having English as their first language, not agreeing to the consent form, and failing to complete the survey. The adequacy of completing the study was determined as completing less than 100% of the survey, as every part of the survey is essential for data analysis. No attention or manipulation checks were used in this study. Of the 54 people who completed the survey, data from only 52 people was used in the final sample, as some of this data was from pre-data collection trials, and some did not meet data collection criteria—specifically, those who did not adequately complete the study.

Power and Effect Size Considerations

A power analysis for a one-way ANOVA using a power of 0.8, considering three independent variable levels, and utilizing a moderate effect size ($f = 0.28$) suggested a sample size of 42. We increased our sample size to 50 participants to overcome possible data issues. This was a successful prediction, as we had a couple of responses that needed more viability for data analysis due to incomplete data.

Procedure

Participants recruited from Prolific would be provided with the Qualtrics survey. Once they complete the consent form, they are presented with a demographics questionnaire and a

Significant Other Information Collector. This form prompts the participants to provide names of close family members, romantic partners, or a current romantic interest/crush. Participants are prompted to fill out the Generalized Anxiety Disorder - 7 (GAD-7⁵). The GAD-7 is a typical clinical screening for Generalized Anxiety Disorder, which will gather data about the base levels of anxiety that participants experience. The GAD-7 is an integral part of the questionnaire, as it collects the data needed to make a sound claim regarding the effect of anxiety on a given individual's moral decision. Then, the participants are presented with vignettes that have been randomly assigned based on the three conditions of a stranger, romantic partner/interest, and family member. Each vignette has three types, and the survey randomly chooses one of the scenarios to present the participants with the randomly chosen condition.

The participants are presented with four vignettes, with the first consisting of two parts. Each vignette had three conditions (romantic interest/partner, family member, and stranger), and each participant received a randomly selected condition for each vignette. Each vignette would present a potentially fatal scenario in which the participant is prompted to choose whom they would sacrifice and save. The vignettes are presented alongside three multiple-choice questions, one saving the condition they were assigned to, one saving the stranger condition, and one giving the participant the choice to omit their decision entirely. The vignettes typically include the condition that the participant is assigned to as one option, and the other option being a stranger or, in a lesser common variation, that involves two stranger conditions, child and adult, and prompts the participant to save one or the other. This questioning format is included to gain data

⁵ General Anxiety Disorder - 7. This is a seven item questionnaire that has three levels that the participant can choose between. Each of the seven choices in this questionnaire get added up together, and the final score gives an insight to the individual's anxiety level. These questions are also specified to the span of the last two weeks, meaning they ask "In the last two weeks..."

on the consensus, whether participants would be more likely to choose to save the life of a child or of an adult, both conditions being strangers to the participant.

Materials

Vignettes

Part one of Vignette number one presents the participant with a randomly assigned condition between a stranger from Tinder, their significant other, or a family member. It prompts them to save the condition that they were assigned to or five men (i.e., saving a stranger from Tinder or five men or saving the participant's significant other or five men). Part two of Vignette Number One changes the five-man condition to a one-person condition, prompting the participants to decide whether to physically push a stranger off a bridge to save another stranger or physically push a stranger off a bridge to save their significant other or family member.

Vignette number two presents the more imaginative scenario of an AI demolition machine misfiring and putting the participant in a hypothetical situation where they are forced to veer the machine into their own house that is actively occupying either a home inspector (stranger condition) or a significant other/family member (interpersonal relationship condition). The participant's other option is to veer the demolition machine into a nearby townhouse with three people. The participant is then met with the decision of either killing their significant other or family member or the house inspector and saving three people or doing the reverse operation of the scenario. An additional third option allows the participant to omit their decision entirely, choosing not to save or sacrifice any given party.

Vignette number three places the participant in the scenario of being a truck driver behind the wheel of a vehicle that possesses faulty brakes. The options in this scenario involve letting

the truck continue forward, killing three children, or veering the truck towards an undetermined number of adults, one of which includes the participant's significant other/close friend. Like the other vignettes, this vignette also presents the third multiple-choice option as omitting the decision entirely.

GAD-7

One of the core questionnaires of this study was the GAD-7, a seven-item generalized anxiety disorder questionnaire. Below is a chart that details the different intensity levels represented by the total score of the participants' GAD-7 questionnaire results. This specific organization of the identification of intensity levels resulted from dividing the number of intensities by the total possible number of points that can be scored on the GAD-7. The highest score is twenty-one, and when divided by the number of intensity numbers (5), we get $21/5 = 4.2$, rounded to four, making it so that an interval of four levels represents each intensity level. Normal is defined by the range of zero to four, while the numbers of fifteen to nineteen represent severe; each of these numbers will indicate a given intensity level. The “Extremely Severe” category is only composed of two levels instead of four, like the previous levels of severities. This decision was made because the term “extreme” gives the impression that it is rare or ultimate, which would have a lower occurrence when compared with the other levels.

Figure 3*GAD-7 Scores and Intensity Levels*

Intensity	GAD-7 Total Score
Normal	0-4
Mild	5-9
Moderate	10-14
Severe	15-19

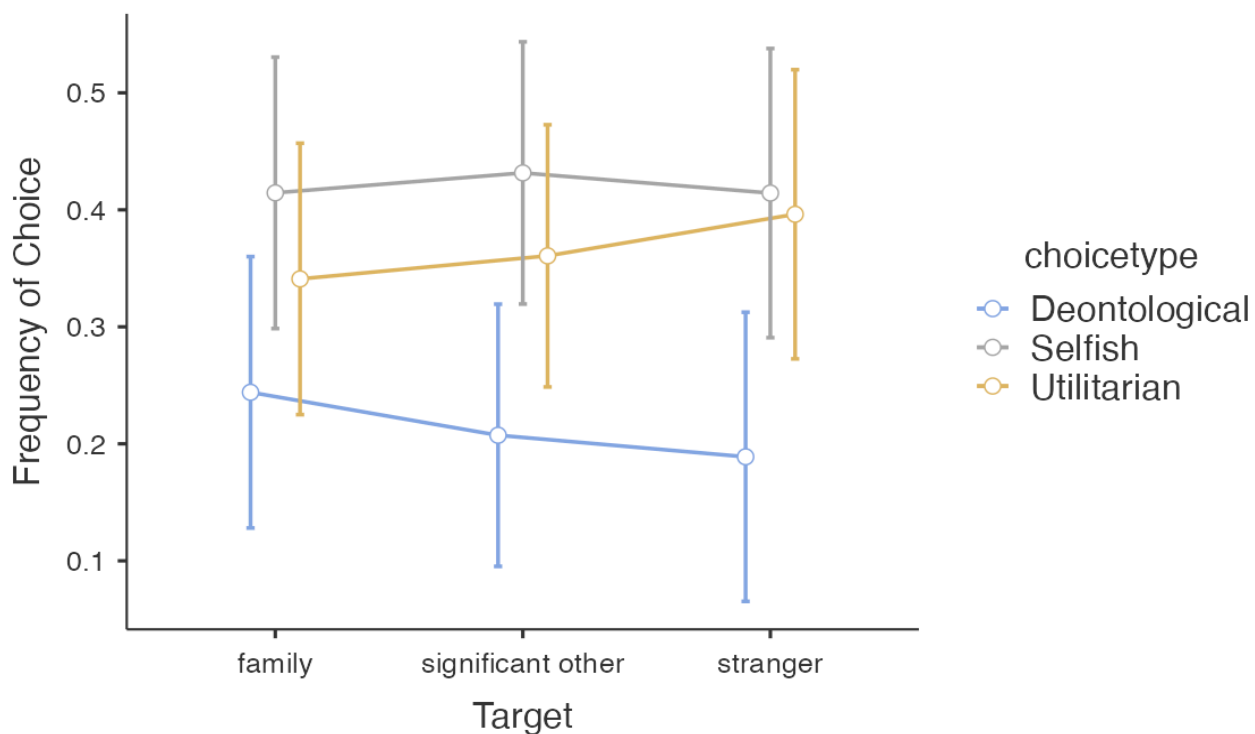
Results

Primary Analysis

An ANOVA model was used to predict how often the respondents chose to make a decision based on factors of type of person to be saved (family member, romantic partner, or stranger) and kind of choice (deontological, selfish, or utilitarian). This means that the interpersonal relationship variable predicts the moral decision of which condition is saved or the decision of refusing to make the decision entirely. The model was used to see if there was an effect between participants choosing to save a given condition and considering interpersonal relationships being included in the dilemmas. The ANOVA shows that there was no statistically significant interaction between the IR condition (significant other, family member, and stranger) and the type of choice being made (utilitarian, deontological, and selfish), $F(4, 363) = 0.23, p = 0.92$. That is, the addition of interpersonal relationships to each trolley dilemma vignette did not encourage the participants to make the non-utilitarian, selfish decision. The data analysis was conducted by predicting the dependent variable (the type of moral decision being made: utilitarian/saving multiple strangers, deontological/refusing to make a decision, and selfish/saving the significant other or family member) through the levels of the independent variable using an ANOVA. This implies that the level of IRs- romantic significant other, family member, and stranger- predicts the moral decision that the outcome will result in (determining who the participant saves in the vignettes). This non-significant relationship is shown in Figure 4.

Participants chose their significant other or family member (when these options were presented) slightly more frequently than the different conditions. The ANOVA indicated no significant interaction effect between the participant's choice to save and the type of choice

made. The choices were divided into utilitarian, deontological, and selfish. The utilitarian choice indicated that the participant chose to sacrifice their loved one to save multiple strangers, the deontological choice meant that the participant refused to make a choice, and lastly, the selfish choice illustrates that the participant chose to save their loved one instead of saving multiple strangers or refusing to make a decision. Across participants, there was a main effect of choice, $F(2, 363) = 9.69, p < .05$, with the deontological choice (i.e., not making a choice) less frequently chosen than either the selfish or utilitarian choices. This means that participants decided not to make a choice more often than they chose to save their IR or to save multiple strangers. This relationship can also be shown in Figure 4.

Figure 4*Frequency of Choice and Choice Type*

Note. This figure shows the frequency of choice (who the participant chose to save out of the following combinations of scenarios: significant other versus multiple strangers, family member versus numerous strangers, and one stranger versus multiple strangers). The x-axis shows the chosen target: family member, significant other, or stranger, and the y-axis represents the frequency of choice, meaning how often the participant decided to save a given condition.

In contrast to my hypothesis, there was no significant correlation between selfish decisions when it concerned a moral dilemma that presented the participant with saving their significant other or family member and sacrificing multiple strangers $p = 0.923$.

Exploratory Analysis

The exploratory hypothesis focused on how anxiety may impact moral decision-making. Specifically, how anxiety affects the probability of the participant making a deontological decision. The ANCOVA that was run for the exploratory analysis showed that anxiety did not present as a statistically significant result as it did not have an impact on whether the participant chose a decision that swayed towards being one of a utilitarian, deontological, or coming from a selfish nature. My exploratory hypothesis predicts the dependent variable by the level of the independent variable as it corresponds with the anxiety score. This implies that the level of the interpersonal relationship, ranging from a romantic significant other, family member, or a stranger, as well as the score that the participant acquired on the GAD-7, predicts the moral decision that is made: saving a family member, saving a stranger, or choosing not to make a decision.

My initial hypothesis suggested that when a participant possesses a score on the GAD-7 that results in the conclusion that this participant can be identified as an anxious individual, that participant will often choose to omit their decision. The data did not support this exploratory hypothesis, as there was no significant correlation between high anxiety scores on the GAD-7 and the type of choice that was made (selfish, utilitarian, and deontological). The addition of GAD-7 scores did not significantly improve the interaction, $p = 0.92$, indicating no significant findings for this hypothesis.

Discussion

This study aimed to better understand whether interpersonal relationships affect moral decision-making. This is important because it delves into the questions of decision-making processes. This can be applied to any situation that concerns making decisions that involve an IR and a stranger group. Examples of this situation in the real world would be someone in a higher power position having to decide between providing someone they have a personal relationship with a job versus employing a stranger. In this situation, the employer may feel obligated to hire someone they are familiar with compared to the stranger. The trolley problem is more than just theoretical. It models real-life situations that individuals encounter daily. People must choose whether to prioritize themselves or others daily, with consequences large and small.

Interpersonal Relationships on Decision-Making

Contrary to my hypothesis, IRs in this study did not affect moral decision-making. However, this study had several limitations that could have led to the results that the study concluded with. The statistical test that was run, the ANOVA, did not show any significance. Still, perhaps a survey that identifies and deals with the limitations of the present study could yield significant results. Although the results showed a slight significance of IRs affecting the type of decision being made, the results were not statistically significant. Perhaps it may be a result of the wide range of participant age or the lack of diversity of ethnic groups in the sample.

Anxiety on Decision Making

The ANCOVA that was run concerning how anxiety may impact moral decision-making also did not show a significant effect; it did not show an effect at all. Anxiety was not a reliable

indicator of the participant's choice in the trolley dilemma vignettes. The anxiety scores had no relation to any of the three conditions, as determined by who the participant decided to save, used in the study: utilitarian, deontological, or selfish. This data did not support my exploratory hypothesis, as a higher score on the GAD-7 did not indicate a deontological moral approach.

Limitations and Further Research

There are several limitations to this study. No manipulations or attention checks were used. This limitation could mean that the participants needed to pay more attention, skim through the survey, or select choices at random to complete it. This means that we are still determining if the participants involved in the data collection for this study were paying adequate attention to the questions.

Another limitation of this study is the age range. There was not a specific age group or a target population in mind when creating this study, which means that no particular conclusions can be drawn about these questions of the effect of interpersonal relationships on morality and anxiety on decision-making from this general population study. Future research could have a target age group, narrowing the population and making it more viable to cast generalizations on a given population. Another study may examine how age affects an anxious group's decision-making. However, since a target age group was not determined and specified in this study, the survey reached a wide variation of participants, leading to a more evenly represented population regarding age.

Additionally, a limitation that could be perceived from this study is the need for more population diversity. There were no participants who identified themselves as being "Native Hawaiian or Other Pacific Islander," and no participants who identified themselves as "Middle

Eastern or North African,” which resulted in a complete lack of participation from two of the seven ethnic groups included in the demographic survey. There was one participant who identified as “American Indian or Alaskan Native,” five who identified themselves as “Asian,” and seven participants who identified as “Black or African American,” which stood out as being the second largest group of participants. Participants identified as “White” made up 75% of the total population. In this study, the white population is overrepresented, which leads to inaccurate observations or the inability to generalize these results since the population does not encompass a diverse group of participants. Future research can focus on encouraging a more diverse population by potentially creating a cut-off number for each ethnicity. This can look like setting up the experiment so that the survey, or the mode of data collection used, only accepts 14.3% of each of the seven ethnicity choices.

The study was also conducted through a survey, meaning that the best we could scope is the declarative response that the participants would assume they would have in the hypothetical scenario. Still, in actuality, it needs to be an accurate representation of what their actual behavior may be. This idea was mentioned by Navarette et al., 2012, and they created a study of what would now be the ideal reproduction of the present study: one that encourages the participants to assert a more actual decision rather than a hypothetical one. This can be done by doing as Navarette et al., 2012 did in their study: simulating a reality that motivates a behavior or decision that is on par with the actual behavior or as close as it is ethically possible to do so. In the study by Navarette et al., 2012 this design was conveyed through virtual reality. Still, future research can also utilize actors to enact a virtual reality situation. However, this may have some ethical issues regarding the stress and potential psychological strain this may put on the participants.

Another limitation of this study was the need for careful consideration regarding the emotional connotation of the IR used in the survey. The participants were not asked if they were completing the Significant Other Information Collector using personal connections that were positive, negative, or even neutral. Just as there are positive IRs which may cause someone to kill the five people and save the person that they have an IR with, there are negative IRs which may contribute to a person's choice of killing the one person (whom they have the negative IR with), thus saving the five other people. This choice would have nothing to do with being either utilitarian or deontological. Still, a future study may focus on how likely people with anxiety are to make certain decisions given that the person with whom they have a negative or neutral IR is in the trolley problem. Although this idea was briefly mentioned in the introductory phases of this paper, it is not a concept that was given enough attention. This led to the survey's creation without the consideration that this may have an impact on the results, as the participants are not directly instructed to provide the names of either a significant other or a family member of which they are not only on good terms with but care about very deeply. Without this specification, there may not have been enough tension between sacrificing a loved one rather than someone with whom the participant is associated. This detail may make it so that the implications of the trolley dilemma scenarios that the participants were presented within this study were not presented with enough emotional charge as they could have been to ensure that the participants acknowledged the full hypothetical consequence of the moral decisions that they are making.

Conclusions

The present study attempts to gather findings regarding interpersonal relationships' role in moral decision-making. Although the primary hypothesis failed to yield any statistically

significant results in this study, it is essential to ask these questions to better understand the role that personal relationships play in people's actions. Additionally, there were no statistically significant results regarding the level of anxiety a person had been experiencing in a recent period, in this case, a period of two weeks, and the chances that they would choose to save their IR, save multiple strangers, or refuse to make a decision. This factor still stands as a potentially significant element when making decisions, specifically moral ones, as an anxious person who is rated as such by the score of their GAD-7. Future research focusing on the current study's limitations could better ask and focus on these questions.

References

- Bleske-Rechek, A., Nelson, L. A., Baker, J. P., Remiker, M. W., & Brandt, S. J. (2010). Evolution and the trolley problem: People save five over one unless the one is young, genetically related, or a romantic partner. *Journal of Social, Evolutionary, and Cultural Psychology*, 4(3), 115–127. <https://psycnet.apa.org/fulltext/2011-13654-001.pdf>
- Deniz, M. E. (2011). An investigation of decision-making styles and the five-factor personality traits with respect to attachment styles. *Kuram ve Uygulamada Eğitim Bilimleri*, 11(1), 105–113. <https://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2012-11258-004&site=ehost-live>
- Foot, Philippa, ' The Problem of Abortion and the Doctrine of the Double Effect*', *Virtues and Vices: and other essays in moral philosophy* (2002; online edn, Oxford Academic), <https://doi.org/10.1093/0199252866.003.0002>
- Larry, A., & Moore, M. (2007). Deontological ethics. https://plato.stanford.edu/entries/ethics-deontological/?trk=article-ssr-frontend-pulse_x-social-details_comments-action_comment-text
- Mancini, F., & Gangemi, A. (2015). Deontological guilt and obsessive compulsive disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 49(Part B), 157–163. <https://doi.org/10.1016/j.jbtep.2015.05.003>
- Maranges, H. M., Chen, S. K., & Conway, P. (2022). Insecure and insensitive: Avoidant and anxious attachment predicts less concern for others in sacrificial moral dilemmas. *Personality and Individual Differences*, 185. <https://doi-org.ezprox.bard.edu/10.1016/j.paid.2021.111274>
- Martins, A. T., Sobral, T., Jiménez-Ros, A. M., & Faísca, L. (2022). The relationship

- between stress, negative (dark) personality traits, and utilitarian moral decisions. *Journal of Psychopathology and Clinical Psychology*, 27(3), 205–216.
<https://doi.org/10.5944/rppc.28948>
- Navarrete, C. D., McDonald, M. M., Mott, M. L., & Asher, B. (2012). Virtual morality: Emotion and action in a simulated three-dimensional “trolley problem”. *Emotion*, 12(2), 364–370.
<https://doi.org/10.1037/a002556>
- Robinson, J.,S., Joel, S., Plaks, J., E. (2015). Empathy for the group versus indifference toward the victim: Effects of anxious and avoidant attachment on moral judgment, *Journal of Experimental Social Psychology*, Volume 56, 2015, Pages 139-152,ISSN 0022-1031,
<https://doi.org/10.1016/j.jesp.2014.09.017>
- Thompson, J. (1976). Killing, letting die, and the trolley problem - HCC learning web.
<https://learning.hccs.edu/faculty/david.poston/phil1301.80361/readings-for-march-31/JJ%20Thomson%20-%20Killing-%20Letting%20Die-%20and%20the%20Trolley%20Problem.pdf>
- Zhan, Y., Xiao, X., Li, J., Liu, L., Chen, J., Fan, W., & Zhong, Y. (2018). Interpersonal relationship modulates the behavioral and neural responses during moral decision-making. *Neuroscience Letters*, 672, 15–21.
<https://doi.org/10.1016/j.neulet.2018.02.039>
- Zhao, H., Zhang, C., Tao, R., Duan, H., & Xu, S. (2023). Distinct inter-brain synchronization patterns underlying group decision-making under uncertainty with partners in different interpersonal relationships. *NeuroImage*, 272, 1–12.
<https://doi.org/10.1016/j.neuroimage.2023.120043>

Appendix A

Institutional Review Board Approval

Bard College

Institutional Review Board

Date: 3/18/2024
To: Daniella Dsouza Michaeli
Cc: Justine Dainer-Best; Nazir Nazari
From: Ziad M. Abu-Rish, IRB Chair
Re: Moral decisions and solving dilemmas

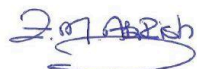
DECISION: Approval

Dear Daniella Dsouza Michaeli:

The Bard IRB committee has reviewed your revised proposal and has approved your application through March 17, 2025. Your case number is 2024MAR18-MIC.

Please notify the IRB if your methodology changes or unexpected events arise.

We wish you the best of luck with your research.



Ziad M. Abu-Rish, Ph.D.
IRB Chair
Associate Professor of Human Rights and Middle Eastern Studies
Bard College (zaburish@bard.edu)

Email: irb@bard.edu | Website: <https://www.bard.edu/irb> | Phone: 845-758-6822
PO Box 5000, Annandale-on-Hudson, New York 12504-5000

Appendix B

Vignette Variants Used in Participant Survey

Vignette #1:

Part one

You and [Insert name of romantic partner, family member, *or* “a first-date with a stranger from Tinder, a dating app”] are on an impromptu picnic date beside a lake. After spending some time eating and chatting, they decide to pretend to be tight-rope walking on the side of the train tracks that are a few dozen feet away from the lake. You also notice the chatter of five men working on a track that is parallel to the track that your partner is on. A loud train whistle blows, signaling that a train is nearby. The loud noise scares [insert partner’s name] and they trip on the train tracks. You realize that you are right next to a lever that reads “Track Change.”

Do you:

- A) Pull the lever and save [Insert name of romantic partner, family member, *or* “a first-date with a stranger from Tinder, a dating app”], but kill five men.
- B) Don’t pull the lever, sacrificing [insert name] for the five men to live.
- C) Refuse to make a decision.

Part two

Imagine that instead you and [Insert name of romantic partner, family member, *or* “a first-date with a stranger from Tinder, a dating app”] are on an impromptu picnic date beside a lake. After spending some time eating and chatting, they decide to pretend to be tight-rope walking on the side of the train tracks that are a few dozen feet away from the lake. Instead of a second track with five men on it, there is one large man on a bridge above the track. You are beside this man. You are confident that if you push him off the bridge, his body will stop the train and save your partner.

Do you:

- A) Push the large man off of the bridge to [Insert name of romantic partner, family member, *or* “a first-date with a stranger from Tinder, a dating app”] your partner.
- B) Choose to not push the large man off of the bridge.
- C) Refuse to make a decision.

Vignette #2:

A construction worker runs to your home and shouts to you, as you are standing on the lawn, that an AI demolition machine is experiencing a misfire while it is still running, and it is actively making its way towards your house. He tells you that you may be able to stop it if you are able to get into the driver's seat and reach the controls. [Insert name of romantic partner, family member, *or* "a home inspector"] is in the house, far away from the front door. You realize that you will not be able to warn them in time, so you run to the AI demolition machine and somehow, successfully hop on. Looking at the controls, you realize that the brakes are not working, and the only thing you can do is steer the vehicle away from your house. Since the area is densely populated, you will not be able to turn the AI demolition machine in a way that avoids casualties; someone else's house will be hit.

Do you:

- A) Steer the AI demolition machine into a nearby townhouse which will kill or severely injure three people.
- B) Let the AI demolition machine crash into your own townhouse, killing or severely injuring [insert names/ "the inspector"].
- C) Refuse to make a decision.

Vignette #3:

You are driving a truck that is unable to stop due to an issue rendering the brakes inoperable. You can either let the truck continue to go forward, hitting three children who are crossing the street, or you can veer the steering wheel to the right, leading the truck onto a sidewalk and hitting [Insert name of romantic partner *or* family member] who is walking on the sidewalk. In either situation, there are no survivors. The truck does not continue to go forward after crashing into either the children or your significant other.

Do you:

- A) Steer the wheel towards the adults, saving [Insert name of romantic partner *or* family member]
- B) Steer the wheel where it was going initially, killing the children.
- C) Refuse to steer the wheel.

Appendix C

Participant Consent Form (As shown on Prolific)

Bard

Title: Moral decisions and solving dilemmas

Researcher: Daniella Dsouza Michaeli

Adviser: Justin Dainer-Best, Ph.D., Assistant Professor of Psychology

Background: I am an undergraduate student at Bard College conducting a study for my Senior Project. This study is an undergraduate capstone project. Upon completion, this study will be available as a physical copy in the Bard College Library, in addition, an electronic copy will be available in the Bard College Digital Commons. I am researching how interpersonal relationships affect moral decision making using the trolley dilemma. These questions will include potential scenarios relating to death, and questionnaires about anxiety. You will be asked to complete a demographic questionnaire, a significant other information collector, the GAD-7 (an anxiety test) and respond to four vignettes before receiving a debriefing form.

Risk and Benefits: Potential risks include the experience of negative scenarios and feeling slight discomfort from that. There are no direct benefits to participating in this study. If at any point you feel discomfort during the study, please feel free to skip a question or exit the survey.

Compensation: You will be compensated with money for your participation for \$2.40.

Confidentiality: This study will not ask you to provide any identifying information. Any such information accidentally collected during the study will be kept private and deleted when data collection is complete. Your non-identifying data may be shared with other researchers, but no personal information will ever be accessible to others.

Further concerns: If you have any questions or concerns, you may contact Daniella Dsouza Michaeli at dd5421@bard.edu.

If at any time you feel concern for yourself during or after your participation in the study, you can reach out to a crisis call line by dialing 988 or you can text "HOME" to 741741 for CrisisTextLine for support.

If you have any questions about your rights as a participant, you can contact the Bard Institutional Review Board at irb@bard.edu.

Participant Agreement:

By checking the box below, you affirm your consent to participate and acknowledge that you are 18 years of age or older.

☐ I agree

Appendix D
Participant Demographic Questionnaire (As shown on Prolific)

Bard

Demographic Questionnaire

How old are you?

Which gender do you identify with?

☐ Male

☐ Female

☐ Non-binary / other

☐ Prefer not to say

Which category/categories best describe you? Select all that apply.

☐ American Indian or Alaskan Native

☐ Asian

☐ Black or African American

☐ Hispanic, Latinx, or Spanish Origin

☐ Middle Eastern or North African

☐ Native Hawaiian or Other Pacific Islander

☐ White

☐ Wish not to disclose

Is English one of your primary languages?

☐ Yes

☐ No

Appendix E

Significant Other Information Collector (As shown on Prolific)

Bard**Relationships Information**

For the purposes of the study, first names of significant others will be collected and used in the scenarios. List the name of a romantic partner or a crush. If you don't have a romantic partner or romantic interest, use the name of your closest friend.

Please provide the name of a close family member.

Appendix F
GAD-7 Questionnaire (As shown on Prolific)

Bard

Over the last two weeks, how often have you been bothered by the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
Feeling nervous, anxious or on edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not being able to stop or control worrying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble sleeping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that is hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid, as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you checked any problems, how difficult have they made it for you to do work, take care of things at home, or get along with other people?

☐ Not difficult at all

☐ Somewhat difficult

☐ Very difficult

☐ Extremely difficult

Appendix G
Debriefing Form (As shown on Prolific)

Bard

Thank you for participating in this study. This study focuses on interpersonal relationships and how they may have an effect on moral decision making. This research question is being asked through the use of the popular trolley dilemma. We are comparing situations which include an individual of different levels of importance/closeness to the participant and seeing how this may affect who they choose to save in the trolley dilemma.

If you're interested in further reading, here is a brief article outlining the trolley dilemma: <https://theconversation.com/the-trolley-dilemma-would-you-kill-one-person-to-save-five-57111>

The task and questionnaires may have been upsetting to some. If you need any additional resources on mental health, please use the links below:

- Call or text '988' for a crisis hotline
- Text "HOME" to 741741 for CrisisTextLine

If you have any questions, you may contact Daniella Dsouza Michaeli at dd5421@bard.edu, the Bard IRB at irb@bard.edu, or the supervising professor Justin Dainer-Best at jdainerbest@bard.edu

Appendix H

Experiment Preregistration

Preregistration Template

Based on the OSL/PT Preregistration Template. Fill below headings with your own information.,

Preliminaries

Title

Anxiety on Action and Inaction

Investigator's Name and Affiliation

Daniella Dsouza Michaeli, Bard College

Date of Preregistration

February 22, 2024

IRB Status

- Submitted

Variables

What are your independent / grouping / predictor variables (including mediators and moderators) ? Explain how you operationalize each variable.

Interpersonal relationships

- Groups: Friends, Significant other, family member
- Randomly assigned to interpersonal relationship choice for different vignettes
 - Using the 5 trolley dilemma variants

Anxiety (as measured on the GAD-7)

What are your dependent / outcome variables? Explain how you operationalize each variable.

Moral decision

- Assessed through multiple choice questions presenting a variety of moral outcomes:

- (a) Save the target person (b) Save the unknown group (c) Refuse to act

There are five vignettes. They will be analyzed individually (between groups by interpersonal relationship) as well as together (interpersonal group within participants)

List any exploratory variables. These are variables that you included in your study, but are not central to your main predictions.

- Measuring whether people choose to use a romantic partner versus a close friend in the personal connection questionnaire
- Measuring demographics: age + gender

Did you create new, or modify existing, variables for this study?

- Some, or all, variables have been used in prior, published research, and no modifications were made
 - GAD-7 (Spitzer et al., 2007)
- Some variables were modified from their original form
 - Using new versions of the trolley dilemma
- Some variables were created for this study

Hypotheses

What are your primary study hypotheses / research questions?

If a moral dilemma is presented with the inclusion of a party that is of personal significance to the participant, then they will be more likely to choose that person over a number of lives, in a life or death situation.

Do you have any exploratory hypotheses / research questions? If so, describe them below:

Anxiety will have an effect on the moral-decision. More anxiety will lead to more responses of "choosing not to respond." This will be tested to see if anxiety interacts with the IV from the primary hypothesis.

At the time of this preregistration, describe the status of data collection

Data collection has not started for this study

Sampling

What is your target sample size?

50

How was your target sample size determined?

A power analysis for a one-way ANOVA using power of 0.8, three levels of the IV, and a moderate effect size ($f = 0.28$) suggested a sample size of 42. We increased our sample size to overcome possible data issues.

How will you determine when to stop collecting data (i.e., your stopping rule)?

When the target sample size is reached

Research Design

What type of research design are you using?

Quasi-experiment

Experimental designs only

If you are conducting an experiment, what is the nature of the manipulation? (Delete all that do not apply)

Mixed (primary hypothesis is within, but anxiety is a between-participants factor)

Will participants be randomly assigned to condition?

No

All participants will be exposed to vignettes involving the two interpersonal relationship conditions and the stranger condition. Anxiety in this study is not a condition that can be assigned.

Data Analysis Plan

What will be your criterion for determining statistical significance?

$p < .05$

Will your tests of significance be:

Two-tailed

Will you exclude participants from data analysis based on any of the reasons listed below?

Missing data: excluding participants who do not have responses to the vignettes.

Which statistical tests will you use to conduct your data analyses?

Analysis for main hypothesis: Predicting the DV by level of the IV using an ANOVA

IV: Interpersonal relationships: levels: partner, family member and stranger.

DV: Moral decision: saving a family member, saving a stranger (or strangers) and choosing not to make a decision. I will be collecting the number of responses that fall into each option of the DV

Analysis for exploratory hypothesis: Predicting the DV by level of IV as it interacts with anxiety score, using a regression

IV: Interpersonal relationships: levels: partner, family member and stranger.

IV-2: Anxiety score on the GAD-7

DV: Moral decision: saving a family member, saving a stranger (or strangers) and choosing not to make a decision. I will be collecting the number of responses that fall into each option of the DV