Role Models and Moral Ambiguity: Impacts on Adolescent Moral Decision-Making

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Role Models and Moral Ambiguity: Impacts on

Adolescent Moral Decision-Making

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Abstract

Observing the actions of role models can influence how we behave and make moral decisions, but how do individuals process and apply the morally ambiguous actions of role models? This study sought to identify the differing impacts of observing a role model take a moral, immoral, and morally ambiguous action on subsequent moral decision-making behavior in adolescents. Participants read a story where a role model either told the truth, lied for his own benefit, or lied to help someone else, and subsequently participated in die-roll activities where they had the opportunity to lie for their own advantage or for the benefit of a needy other. I hypothesized that (1) exposure to a role model's morally ambiguous action would lead to less moral behavior than exposure to an immoral or moral action (1a) when the behavior benefitted oneself and (1b) when the behavior benefitted a needy other. Two ANOVA analyses revealed nonsignificant main effects. Contrasts revealed a significant difference between the immoral and morally ambiguous groups and the moral and immoral groups in the other-beneficiary condition. Perception of the protagonist's admirability was a covariate in the self-beneficiary condition and age was a covariate in the other-beneficiary condition. Exploratory analyses were conducted utilizing a binomial probability function to compare group distributions and proportions of lies between groups. Comparisons between the binomial probability distribution and group distributions suggested that lying occurred in all groups and conditions except the immoral group in the self-beneficiary condition. Comparisons between group distributions were not significant, but they were suggestive

of differing trends in behavior between groups. A chi-squared analysis of likely lies also identified greater lying in the morally ambiguous group on behalf of the self and less lying in the immoral group on behalf of another individual compared to the other groups. Although not all analyses reached significance, the trends in the data are suggestive of a differing impact on adolescent behavior after exposure to a moral, immoral, or morally ambiguous action taken by a role model.

Acknowledgements

I would like to thank my research advisor, Dr. Adrienne Tierney, and my thesis advisor,

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Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

Moral Decision-Making

Moral decision-making is the umbrella term used to encompass any decisions with a moral component, "including judgements, evaluations, and response choices" (as reviewed in Garrigan et al., 2018, p. 80). In this sense, we can morally judge and evaluate the behavior of others, make our own moral judgements about what should be done in a situation, and take actions or respond in ways that we have deemed to be morally appropriate (as reviewed in Garrigan et al., 2018).

Sometimes these moral decisions come easily, possibly even intuitively (Haidt, 2001), especially when we are judging others and there is a clear ethical violation (Eden et al., 2015; Krakowiak & Tsay-Vogel, 2013). Other moral decisions may be more complex, particularly when additional factors are involved. For example, the degree to which an ethical dilemma is personal or impersonal can affect emotional processing of the moral judgement (Greene et al., 2001). And reasoning with peers or mothers about moral dilemmas can have significant impacts on children's moral evaluations and decisions (Mammen et al., 2019).

While significant research is conducted in the domain of moral decision-making, Garrigian et al. (2018) observed that the bulk of research on moral decision-making focuses on judgements and evaluations of moral dilemmas, leaving a significant gap concerning moral decision-making as it manifests in behavior. Further research on moral

1

decision-making and response choices is a necessary next step in developing a comprehensive understanding of the consequences and outcomes of moral decision-making.

Moral Ambiguity

Moral decision-making can already be a convoluted task, but it can be made more complex through moral ambiguity. Weiss (1942) defined morality as a set of principles an individual adopts to help themselves determine how to behave. These principles are subjective and influenced by dynamic factors like culture, life experiences, and environment. It is due to this subjectivity that right and wrong in one part of the world may be vastly different in another part. Situations may arise wherein one's morals may not clearly dictate one view or action over another, or where two moral values are contrasted in making a choice. This kind of moral ambiguity can often be more challenging than a clearly moral or immoral situation.

Moral ambiguity seems to be very prevalent in our lives. Moral ambiguity is encountered in everyday situations (Nyberg, 2008), as well as in professional contexts (Johnson & Ecklund, 2016). In the realm of science, ambiguity is a large concern. Johnson and Ecklund (2016) interviewed scientists about ambiguity in the field, and found that ambiguity arose when considerations like altruism, weighing harm against benefit, and considering the ethical goodness of an action were relevant to the situation.

These types of morally ambiguous situations can be difficult to navigate, especially since in most cases a judgement or a decision must be made. Pittarello et al. (2015) found that in these ambiguous situations, individuals seem to pay attention to the

information that is most valuable to them. Similarly, Suri et al. (2019) observed that when a situation is ambiguous, individuals may interpret the information in a way that benefits them. So, we may resolve moral ambiguity by choosing the situation that benefits us most.

However, not all morally ambiguous situations are personally experienced. Sometimes we observe others' morally ambiguous actions and evaluate them. Yet most of the research with ambiguity and other's actions has focused on morally ambiguous characters as a whole (Eden et al., 2017; Grizzard et al., 2019; Krakowiak & Oliver, 2012; Krakowiak & Tsay, 2011; Krakowiak & Tsay-Vogel, 2015), instead of generally moral individuals who engage in a morally ambiguous action. To build a greater understanding of how moral ambiguity affects us, research into the effects of observing another individual engage in a morally ambiguous action will be useful.

The Impact of Role Models

There are many types of individuals that play a significant role in influencing others. Role models, heroes, and leaders are all people we hold in high regard; we have great respect for these individuals and look to them for guidance, either explicitly, through conversation, or implicitly, through observation of their behavior. As a result, these individuals have the potential to significantly impact our behavior (Hurd et al., 2009; Liss et al., 1983; Moore et al., 2019).

Role Models

We observe the actions of others all the time, but the actions of role models may have a larger impact on us. Role models are people that individuals look to for guidance.

Through observed actions or direct interactions, role models communicate valuable information about how to behave. These role models serve as an example to those who look up to them, and as such they have great potential to influence an individual's decision-making and behavior. Many people's first role models are their parents. Parents hold authority and trust in most relationships, so children look up to them to guide their decision-making. In a 2019 study, Mammen et al. found that when discussing moral dilemmas with peers or their mothers, children accepted and acted upon the moral reasoning of their mothers (role models) significantly more than that of their peers.

However, our role models are not restricted to parents. As we age, additional role models tend to emerge in the form of other trusted adults. Both parental and non-parental role models have positive effects on adolescents. Hurd et al. (2009) conducted a study with urban adolescents, evaluating their exposure to role models and negative adult influences; while exposure to negative adult influences did lead to increases in negative behaviors in the adolescents, they also found that the more role models an adolescent had, the greater buffer they had against participating in negative internal and external behaviors. In the case of adolescents, the guidance provided by role models can significantly influence the behavior they engage in (Hurd et al., 2009).

Yet still, our need for role models does not abate with age. Role models are extremely valuable for adults, especially concerning moral decision-making. Among the top three strategies individuals use to avoid bias when facing a moral dilemma is following appropriate role models (Mecca et al., 2014), and a lack of appropriate, ethical role models can lead to lapses in ethical judgement. A study conducted by Yeh et al. (2010) found that Taiwanese nurses felt unprepared to face many workplace ethical

decisions, despite prior ethical training. Additionally, the nurses tended to respond to unethical behaviors taken by superiors with obedience and compliance. Among the main explanations for these issues was a lack of ethical role models. These nurses lacked ethical guidance and modeling, and it led to an uncertainty of how to behave morally. Throughout all stages of an individual's life, role models appear to serve as an important source of guidance, and the research suggests that these individuals can potentially impact an individual's decision-making and behavior (Hurd et al., 2009; Mammen et al., 2019; Mecca et al., 2014; Yeh et al., 2010).

Leaders

Leaders are an important type of role model. While not all leaders will be role models, the ones that are can have a large influence on those that look up to them. Leaders appear in social contexts such as politics, religion, or community groups, as well as professional contexts, such as business organizations or workplaces. Regardless of setting, leaders take on the task of directing their subordinates and the organization as a whole. From both a personal and organizational point of view, leaders hold great potential to influence those that are underneath them in the hierarchy, especially concerning ethics (Reilly, 2006). Moore et al. (2019) found that ethical leaders had significant positive effects on subordinates' behaviors in both morally strong and morally weak individuals. Ethical leaders reduced employee moral disengagement, unethical behavior, and deviant behavior (Moore et al., 2019). In a similar vein, Zhao & Xia (2019) found evidence that a lack of ethical leadership enabled negative behaviors such as moral disengagement and knowledge hiding in nurses with high negative affective states; however, introducing ethical leadership almost completely dissolved this effect,

suggesting that the effects of ethical leadership can surmount these negative processes. Leaders set the expectations of an organization's ethical conduct, and individuals may be impacted by these standards. Overall, these role models may have the ability to set ethical norms and impact moral behavior.

Heroes

From a young age, we are surrounded by heroes. They exist in reality in the form of those working toward the greater good, like firefighters, police officers, and doctors. And they appear on television screens and in fictional stories often accomplishing larger than life feats, like Superman, Batman, and the Power Rangers. Their prevalence in our lives may reflect our preference for heroes; across many scenarios, individuals express more liking for heroes over other types of characters, such as villains or morally ambiguous characters (Grizzard et al., 2019; Krakowiak & Oliver, 2012; Krakowiak & Tsay-Vogel, 2015; Zillmann, 2013). Even though this type of role model is not typically in direct contact with a given individual, they still have the potential to influence attitudes and behavior.

In the sports world, many professional athletes would be considered celebrities. Though sometimes an athlete is so admired that they ascend to hero status in the eyes of their fans. Taking the step from celebrity to hero seems to have some reaching impacts concerning attitudes and behavior. These 'heroic' athletes can alter individuals' interpretation of social issues (as reviewed in Shuart, 2007) and they can also influence the purchasing habits of their admirers (Shuart, 2007).

Similarly, fictional heroes can affect the behavior of individuals. Van Tongeren et al. (2018) found that simply viewing the image of a superhero led to more prosocial

behavior, suggesting that the positive attributes we associate with superheroes may inspire us to act in kind. However, not all actions of fictional heroes lead to positive behavior outcomes. Liss et al. (1983) looked at the effects of prosocial messages and aggressive actions in superhero television shows. In this study, children who viewed a show with a prosocial message where the superheroes took aggressive actions were less likely to help another student, and more likely to make work harder for the other student, in a subsequent behavioral task.

Role models, heroes, and leaders may hold distinct positions in our lives, but their overarching function is the same. We hold individuals within these groups in high regard and as a result we are susceptible to their influence. This influence appears to be wide reaching, impacting attitudes, decision-making, and behavior. But these influences are not always positive, so exploring the specific contexts and mechanisms involved in their influence is necessary, particularly as they relate to moral ambiguity and moral decision-making.

Role Models, Moral Ambiguity, and Moral Disengagement

We typically expect role models to act in a consistently moral manner. So, when a role model takes a morally ambiguous action, how do we process and apply that behavior? It is likely that we will excuse the behavior in order to maintain a positive view of the role model through moral disengagement (Gino & Galinsky, 2012). Moral disengagement is a process that allows individuals to separate out behavior from their morals (as reviewed in Moore, 2015). Individuals can disengage from their typical morality and excuse the behaviors of themselves or others. Moral disengagement often

occurs when our own actions would conflict with our morals. This conflict can occur in a multitude of different situations. Vincent et al. (2013) studied the relationship between positive affect, dishonesty, and moral disengagement; they found that individuals who experienced higher positive affect were more likely to lie in a self-report task to earn more money, and moral disengagement was the underlying process enabling this deceit. Moral disengagement is also a key mechanism in cheating and avoiding negative emotions, such as guilt (Shu et al., 2011).

Moral disengagement is not limited to an individual and their own actions. Moral disengagement is particularly relevant when considering role models, since our desire to continue to hold those individuals in high regard may lead to moral disengagement. Among the largest predictors of moral disengagement when evaluating fictional characters are liking (Krakowiak & Tsay, 2011; Krakowiak & Tsay-Vogel, 2013), character similarity (Tsay & Krakowiak, 2011), and identification (Sanders & Tsay-Vogel, 2016; Tsay & Krakowiak, 2011). Therefore, if an individual likes a character (liking), feels that the character is similar to themselves (character similarity), or shares feelings or perspectives with the character (identification) (Cohen, 2001), then moral disengagement is more likely to occur when the actions of the character conflict with the individual's morals. Additionally, Sanders and Tsay-Vogel (2016) evaluated the individual and combined effects of identification, narrative exposure, and moral judgement on moral disengagement; they found that the more moral an individual perceives a character to be, the more paths there are to moral disengagement. In this sense, moral disengagement is more likely to occur with people we already perceive to be moral or "good." This effect is not limited to fictional characters. Gino & Galinsky

(2012) showed participants who experience psychological closeness with an individual who behaves unethically can activate moral disengagement in order to dismiss or downplay the actions of the other individual, as well as their own subsequent immoral actions. And in a wider scope, sports fans who identify with a specific team also utilize moral disengagement to protect their image of their team's morality and dismiss accusations against them (Yildiz, 2016).

This literature suggests that individuals can engage in moral disengagement to separate their own behavior, or the behavior of others, from their moral values. Overall, this process can occur in a wide variety of contexts and allows individuals to maintain certain perspectives or behaviors without experiencing dissonance. Therefore, moral disengagement may underlie the process by which individuals interpret and apply a role model's morally ambiguous action, and possibly influence subsequent behavior.

<div align="center">Study Aims and Hypotheses</div>

This study aims to identify the impact of a role model's morally ambiguous action on adolescent moral decision-making by focusing on the following aims:

Aim 1

This study aims to identify the differing impacts of a role model's moral, immoral, and morally ambiguous action on adolescents' subsequent moral decision making. Based on prior literature showing the potential for role models to influence the decisions of those who admire them and the processes of moral disengagement, I predict

that exposure to a role model's morally ambiguous action will lead to less moral behavior than exposure to an immoral or moral action.

Aim 2

This study aims to identify the span of influence of a role model's moral, immoral, and morally ambiguous action on adolescents' subsequent moral decision making by evaluating behavior in a similar situation and a tangential situation. Research on moral disengagement suggests that spillover effects may occur when morally disengaging and studies on role models suggest that individuals are more likely to morally disengage when they view the individual as moral, so I predict that the role model's morally ambiguous action will influence behavior both (1a) when the behavior benefits oneself and (1b) when the behavior benefits a needy other.

Aim 3

This study aims to evaluate the degree to which an individual's perception of a role model (e.g. admirable, heroic) may impact both the evaluation of that role model's actions and the individual's subsequent moral decision-making behavior. This study is not making any direct hypotheses about this factor, but I do expect to see some relationships between perception of the role model and/or evaluation of the action taken by the role model, and the subsequent moral decision-making behavior of the individual.

Study Hypotheses

This study hypothesizes that (1) exposure to a role model's morally ambiguous action will lead to less moral behavior than exposure to an immoral or moral action (1a) when the behavior benefits oneself and (1b) when the behavior benefits a needy other.

Significance of Study

Role models have the potential to impact our attitudes and behavior, but we do not fully understand the scope of this impact, especially concerning its relationship to morally ambiguous actions. The present study seeks to extend the literature on moral decision-making by identifying how exposure to a role model's morally ambiguous action affects subsequent moral decision-making, particularly concerning behavior.

The results of this study have the potential to illuminate the impact of moral ambiguity on an adolescent population. Moral ambiguity is prevalent in both fiction (Polatis, 2014; Shevenock, 2019) and reality (Chambers, 2013; Thomas, 2005; Zwillich, 2018), and regular exposure to others' moral ambiguity is common, as high regard individuals tackle difficult situations in an increasingly public and interconnected world. An understanding of how adolescents interpret and apply morally ambiguous actions taken by role models has the potential to be applied in a variety of contexts. Teachers and parents may be able to make more informed decisions about the content they expose adolescents to, both in terms of curriculum selection and their own behaviors in front of adolescents. The results of this study may also be relevant to media development and curation to help inform decisions about character actions or reporting information. Overall, this study will expand the field's understanding of the interaction between role

11

models, moral ambiguity, and adolescent moral decision-making behavior, potentially

leading to further study in these areas.

Chapter II

Method

Participants

Participants consisted of 166 adolescents aged 11-14. Participants were recruited

by being enrolled in a core class in 7th or 8th grade at a participating middle school in

Northern California. Five teachers partnered with the researcher to assign the study to

their classes. Parents received a notification of the study two weeks prior to the study

being assigned by the teacher and were given the opportunity to opt their child out of the

study. These students were given an alternate assignment to complete in place of

participating in the study.

Materials and Measures

Materials

Study webpage. The study was conducted online through Qualtrics. Qualtrics enabled

features like timed distractor tasks, linear completion of tasks, and integration of a virtual

die.

Short Stories. The experimental manipulation in this study was the story participants read

about the role model. There were three variations on the same narrative, one for each

group. They varied on the following dimensions: moral (the role model refused to take

money that was not his), immoral (the role model took money that was not his for his

own benefit), and morally ambiguous (the role model took money that was not his to give

to a needy other) action. The role model was a firefighter who performed many admirable

actions before being presented with the moral dilemma. A firefighter was chosen as the

role model due to the impact, importance, and appreciation of firefighters in the local

community, which has faced several wildfires in recent years. These stories were

developed by the researcher (see Appendix A). Independent raters evaluated all three

stories to confirm the actions as moral, immoral, or morally ambiguous (see Appendix

B). A weighted Cohen's Kappa revealed almost perfect agreement between raters, $k =$

.905.

Distractor Tasks. Before completing the behavior task, two distractor tasks were utilized

to keep participants from guessing the true measure of the experiment. Immediately after

reading the story participants were asked to write a short story for 6 minutes (see

Appendix C). The screen automatically timed out and moved to the next section at the

end of 6 minutes. A second distractor task was utilized to even further reduce the

likelihood of outcome awareness. After completing the writing task, participants moved

on to solve simple math problems for 4 minutes (see Appendix C). The screen

automatically timed out and moved to the next section at the end of 4 minutes. The study

manipulation and distractor tasks were also divided into two 'sections,' clearly labeled

"Storytelling" and "Problem Solving," to minimize the likelihood of participants

connecting the experimental manipulation with the behavior tasks. The behavior tasks

were not labeled and were framed as a benefit of completing the study.

Virtual Die. For the behavior tasks, participants rolled a virtual die to determine how

many times their name (first task) or a needy stranger's name (second task) was entered

into a drawing for a $50 Amazon gift card. Participants were asked to predict the

outcome of 10 different die rolls and report the number they correctly predicted. This

final number determined how many times the name was entered into the raffle for the gift card. Each participant completed this task twice, once for their own name and once for the name of a needy stranger ("Jane," a needy elderly woman in their community).

Measures

Self-report Die Rolls. The self-report die rolls facilitated by the virtual die-rolling task measured the behavior outcome of the experimental story manipulation. Participants had the ability to lie to improve their chances (or the chances of a needy other) of winning the gift card: for each correctly predicted roll their name was entered into the raffle an additional time (see Appendix D). This task was developed specifically for this study by utilizing the language and norms of several other studies that used die roll and/or prediction tasks (Bucciol & Piovesan, 2011; Fischbacher & Föllmi-Heusi, 2008; Greene & Paxton, 2009; Hao & Houser, 2017).

Heroic Assessment Scale. This scale was developed by the researcher to assess baseline perceptions of heroism in the protagonist (based on his profession as a firefighter) and assess the internal validity of the experimental manipulation. Participants responded to four items concerning the heroic qualities of firefighters and three items concerning perception of the protagonist and his action. The first four items were presented together and the last three items were presented together. All items used a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), (see Appendix E).

Short Story Comprehension Check. This measure was developed by the researcher to check that participants understood the events of the story. It consisted of 4 multiple choice questions assessing basic comprehension of plot events (see Appendix F).

Die Roll Comprehension Check. This measure was developed by the researcher to check that participants understood the parameters of the die roll task. It consisted of 3 multiple choice questions assessing basic comprehension of the impacts of correct predictions in the two conditions (see Appendix G).

Funnel Debriefing Questions. These questions were developed by the researcher to determine if any participants guessed the purpose and/or outcome measures of the study. Answers to these questions helped the researcher determine if any data should be omitted from the final analysis, as awareness of the outcome measure of the study may have impacted participant behavior (see Appendix H).

Study Design

This study used an experimental, 3x2 mixed factorial design to assess the effect of observing a role model's moral, immoral, or morally ambiguous action (between-subjects) on an individual's behavior in contexts where lying can benefit themselves or a needy other (within-subjects).

This study was conducted online. The researcher made this decision for logistical reasons. Due to current conditions (COVID-19), it was not feasible to conduct an in-person study. Additionally, the researcher determined that there would not be a significant impact to the study design by conducting it online rather than in person. There were also possible advantages to conducting this study remotely, such as a greater likelihood for participants to act naturally in the behavior task, since there will be little to no perception of oversight or 'being watched.'

Procedures

Participants accessed the study online via Qualtrics. The partnered teachers posted the link to Google Classroom for participants to access it. Participants were shown a screen that instructed them to ensure they had at least 45 minutes to complete the study, as it needed to be completed in a single sitting. The next screen included an assent form detailing the tasks they would be asked to complete, potential risks, and the optional nature of participating; individuals signed this form by typing their name.

Participants answered demographic questions concerning age, gender, ethnicity, socioeconomic status, and teacher's name.

Participants read the story (the experimental manipulation). After reading through the story, participants answered the story comprehension questions. Then, participants completed the first distractor task by writing a story for 6 minutes (timed). A second distractor task followed, which contained simple math problems that participants solved for 4 minutes (timed).

Participants moved onto instructions for the behavior task and proceeded to complete the behavior task on behalf of the self. Participants then received instructions for the task again, which specified that the recipient of the gift card would be a needy other. Participants proceeded to complete the second iteration of the behavior task on behalf of the other person. After the behavior tasks, participants answered the die-roll comprehension questions.

Participants then completed the heroic assessment scale questions. Finally, participants responded to funnel debriefing questions.

Participants received debriefing information after data collection was completed.

Data Collection

All data was collected electronically via Qualtrics. Data collection began on November 4, 2020 and ended on December 9, 2020.

Chapter III

Results

Participants

A total of 166 participants completed the study. All participants were enrolled in the 7th or 8th grade at the same middle school and completed the study as an assignment through one of their classes. Of these participants, 73 were excluded based on the following exclusion criteria: responses in the behavior task that exceeded parameters (16.27%), incorrect responses on more than one item in one of the comprehension checks (25.30%), and suspicion/detection of the study measure as identified by the funnel debriefing questions (1.20%). The final sample consisted of 95 participants. The demographic details of the final study sample population are shown in Table 1.

ANOVA

The main hypotheses of this study were tested with a one-way ANOVA using planned contrasts. Two separate ANOVAs were utilized for each level of the dependent variable (self and other).

There was not a significant effect of role model action on behavior in the self-beneficiary condition, $F(2, 61.28) = 1.45$, $p = .244$, $\omega = .09$ (see Figure 1). Planned contrasts also did not reveal a significant difference between groups in the self-beneficiary condition. The initial contrast compared the moral group to the immoral and morally ambiguous groups, $t(60.24) = .17$, $p = .865$, $r = .02$. The second contrast

compared the immoral and morally ambiguous groups and also did not reach

significance, $t(60.91) = . -1.71$, $p = .093$, $r = .18$. Descriptive statistics and frequency

histograms revealed the data was non-normally distributed with a skewness of .860

Table 1. Demographic Data

Variable	Total	Percent
Sample size	95	
Age		
11	2	2.1%
12	33	34.7%
13	56	58.9%
14	4	4.2%
Ethnicity		
White/Caucasian	66	69.5%
Hispanic/Latino	3	3.1%
Black/African-American	5	5.3%
Asian/Pacific Islander	3	3.1%
Native American or American Indian	3	3.1%
Other	14	14.7%
Prefer not to answer	1	1.1%
Gender		
Female	50	52.6%
Male	41	43.2%
Other	2	2.1%
Prefer not to answer	2	2.1%
SES		
Free or reduced lunch	27	28.4%
Full price lunch	24	25.3%
Did not know	44	46.3%

Note. This table displays demographic information for the participants included

in the final sample. Exclusion criteria was applied before analyzing demographic

data.

Figure 1. Self-Beneficiary Condition Boxplot

This graph displays the mean reported correct predictions for each group in the self-beneficiary condition. Lines within the boxes represent the median. The 'x' represents the mean of each group. Dots represent outliers.

(SE =.247) (see Table 2 and Figure 2), but due to the robust nature of an ANOVA, no transformations of the data were completed.

There was not a significant effect of role model action on behavior in the other-beneficiary condition, $F(2, 61.10) = 3.01$, $p = .057$, $\omega = .16$ (see Figure 3). Planned contrasts revealed a non-significant effect when comparing the moral group to the immoral and morally ambiguous groups, $t(58.19) = -1.08$, $p = .284$, $r = .11$, but a

Table 2. Self-Beneficiary Condition Descriptives

Group	N	M	SD	SE
Moral	32	3.34	2.22	0.39
Immoral	28	2.96	1.86	0.35
Morally Ambiguous	35	3.89	2.42	0.41

Note. This table displays the sample size (N), mean (M), standard deviation (SD),

and standard error (SE) for each group in the self-beneficiary condition.

Figure 2. Self-Beneficiary Condition Frequency Histogram

This stacked frequency histogram displays reported correct predictions in the

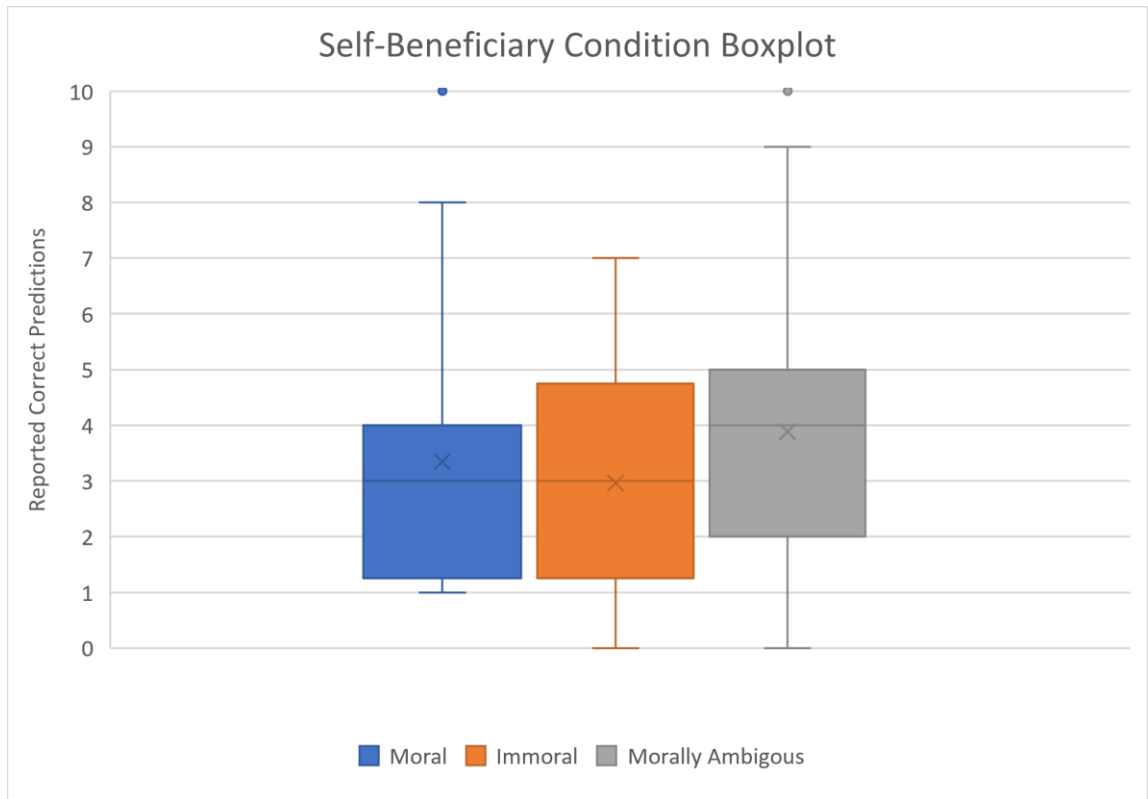*self-beneficiary condition. The data is skewed.*

Figure 3. Other-Beneficiary Condition Boxplot

This graph displays the mean reported correct predictions for each group in the

other-beneficiary condition. Lines within the boxes represent the median. The 'x'

represents the mean of each group.

marginally significant effect in the second contrast comparing the immoral and morally

ambiguous groups, $t(58.92) = 2.01$, $p = .049$, $r = .20$. Descriptive statistics and a

frequency histogram of the data are shown in Table 3 and Figure 4. The results of the

ANOVA suggested a closer relationship between behavior in the moral and morally

ambiguous groups than expected, so Independent Samples t-Tests were utilized to

Table 3. Other-Beneficiary Condition Descriptives

Group	N	M	SD	SE
Moral	32	3.88	2.20	0.39
Immoral	28	2.86	1.60	0.30
Morally Ambiguous	35	3.89	2.45	0.41

Note. This table displays the sample size (N), mean (M), standard deviation (SD),

and standard error (SE) for each group in the other-beneficiary condition.
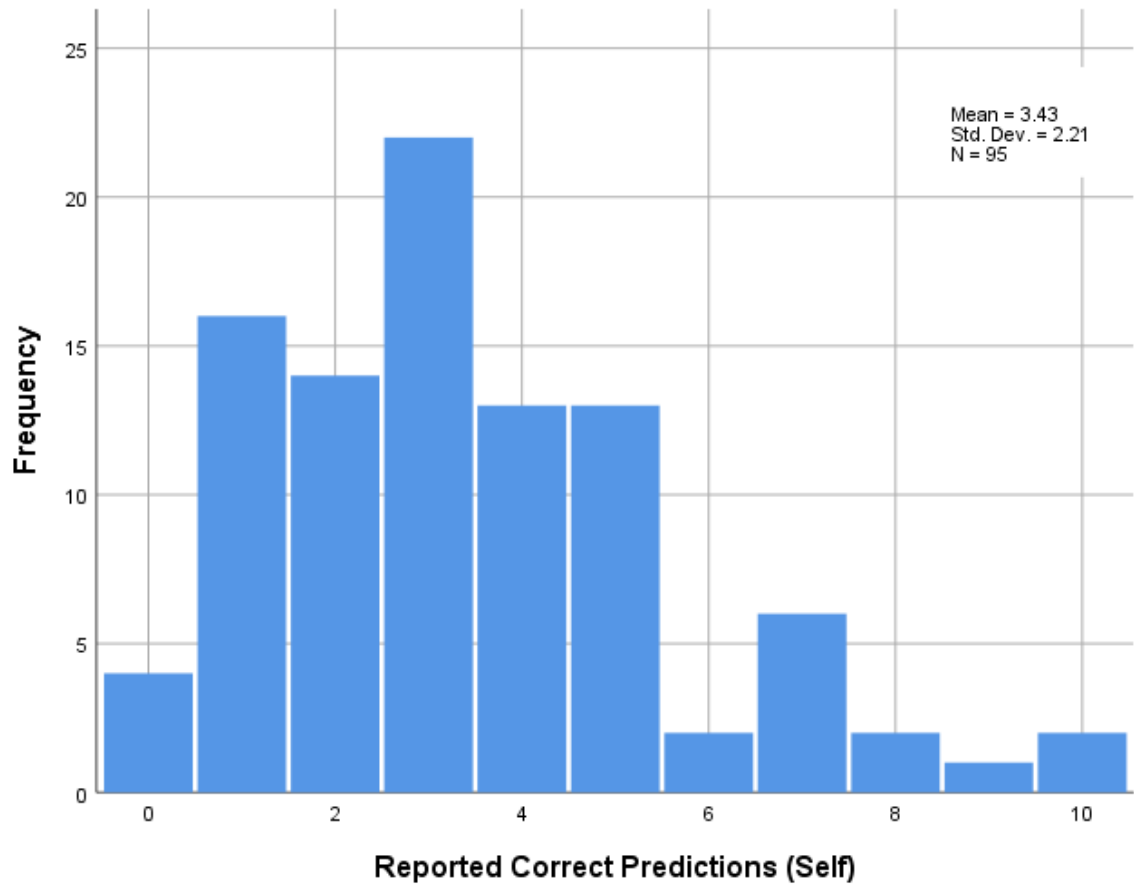

Mean = 3.58
Std. Dev. = 2.171
N = 95
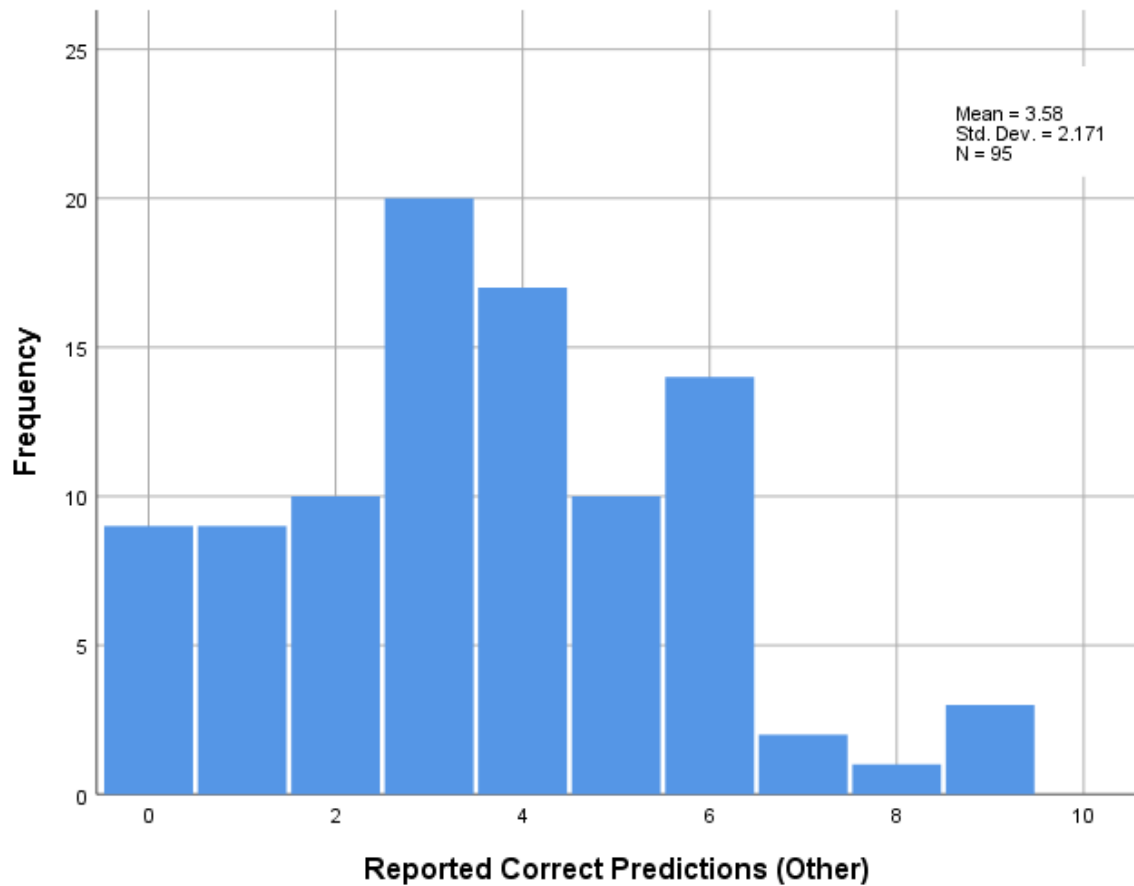
Figure 4. Other-Beneficiary Condition Frequency Histogram

This stacked frequency histogram displays reported correct predictions in the
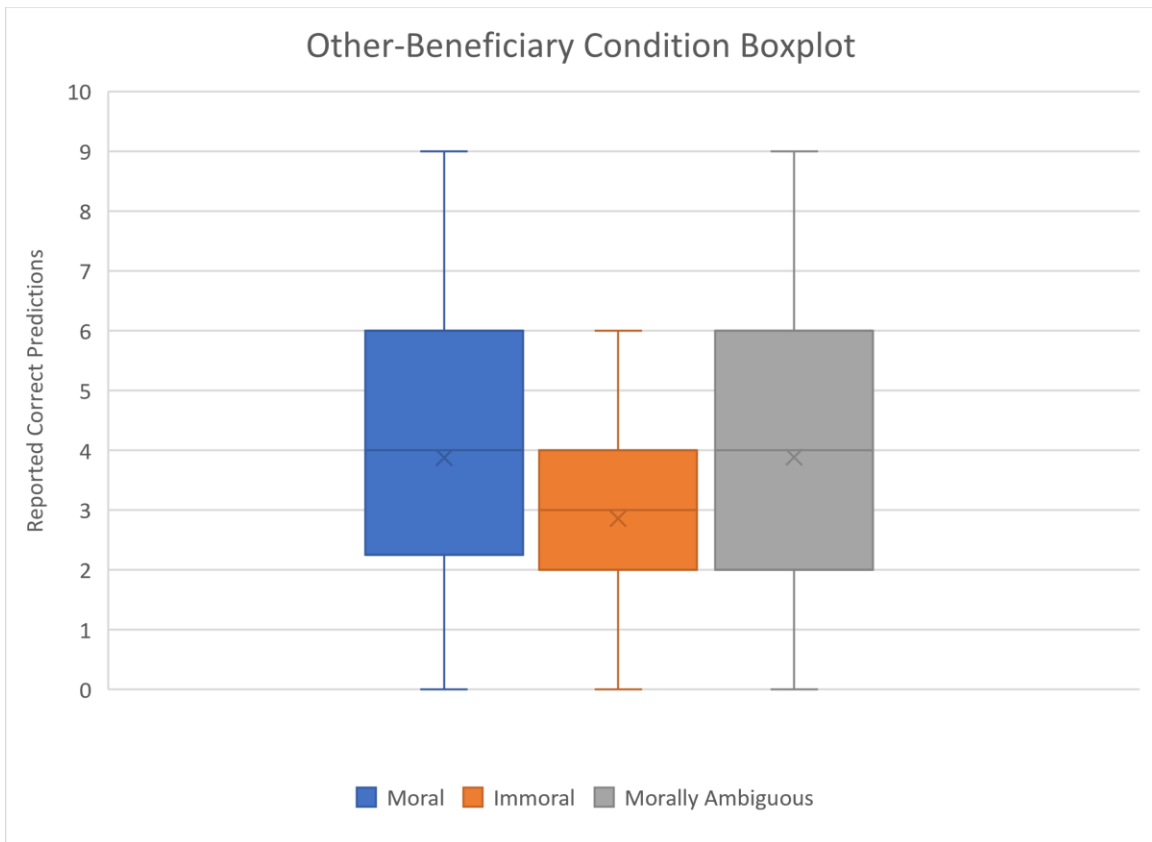
other-beneficiary condition.

24

further illuminate the relationship between the groups (see Table 4). In addition to the

marginally significant difference between the immoral and morally ambiguous groups in

the other-beneficiary condition detected by the planned contrasts of the ANOVA,

Independent Samples t-Tests also revealed a significant difference between the moral and

immoral groups in the other-beneficiary condition, $p = .043$.

Table 4. Independent Samples t-Tests

	Self	Other
Moral - Immoral	$p = .474$	$p = .043$
Moral - Ambiguous	$p = .343$	$p = .985$
Immoral - Ambiguous	$p = .093$	$p = .049$

Note. This table displays the significance values of multiple independent samples

t-tests, separated by condition.

Correlations

Pearson's correlation was significant between the self-beneficiary and other-

beneficiary conditions, $r(92) = .495$, $p < .001$. Behavior in the self-beneficiary condition

was moderately correlated with behavior in the other-beneficiary condition. The positive

relationship of this correlation further suggests that increased reported correct predictions

in one condition correlated with increased reported correct predictions in the other

condition.

Related-Samples Wilcoxon Signed Rank Tests were conducted to evaluate the

similarity of behavior within groups. No significant differences between medians within

groups were detected, but the results of the moral group test, $T = 275.00$, $p = .096$, $r = .21$, were much closer to reaching significance than the immoral, $T = 97.50$, $p = .776$, $r = -.04$, or morally ambiguous groups, $T = 260.00$ $p = .811$, $r = .03$.

Covariate Analyses

Demographic data were entered into the model as possible covariates. In both the self-beneficiary and other-beneficiary conditions, gender, ethnicity, socioeconomic status, and teacher were non-significant, $p > .05$ (see Table 5). Age was non-significant in the self-beneficiary condition, but reached significance in the other-beneficiary condition, $p = .035$, revealing that reported correct predictions increased with age (see Table 5).

Responses evaluating the story's protagonist and his actions were also evaluated as possible covariates; evaluations of the protagonist's hero status and morality of action were not significant, $p > .05$ (see Table 5), but perceptions of the protagonist's admirability were significant in the self-beneficiary condition, $p = .043$. A separate ANOVA determined that responses evaluating the role model significantly differed among groups concerning hero status, $F (2, 91.65) = 4.18$, $p = .018$, $\omega = .25$, admirability, $F (2, 84.15) = 8.98$, $p < .001$, $\omega = .38$, and morality of action, $F (2, 89.19) = 104.04$, $p < .001$, $\omega = .82$, indicating that participants viewed the role model and his action differently based on the action he took in the story. Group means for each question are represented in Table 6.

Data assessing the heroic perception of firefighters entered into the model was not significant, $p > .05$ (see Table 5). This data was further analyzed to assess differences in firefighter perception across groups using an ANOVA, which revealed no significant

differences concerning hero status $F_{(2, 87.78)} = .035$, $p = .965$, ability to help, $F_{(2, 87.93)} = .70$, $p = .498$, leader status, $F_{(2, 85.47)} = .42$, $p = .656$, or admirability, $F_{(2, 89.44)} = 4.1$, $p = .662$. The overall mean for these questions was a 6.25 on a 7-point Likert scale across all groups, indicating that firefighters are generally considered to be role models for this population and were an appropriate figure for the experimental manipulation.

Table 5. Covariate Significance

Variable	Self	B	Other	B
Demographic				
Age	$p = .448$	.347	$p = .035$	.949
Gender	$p = .067$	-.706	$p = .582$	-.204
Ethnicity	$p = .945$	.007	$p = .205$	.123
Socioeconomic status	$p = .908$	-.033	$p = .289$	-.297
Teacher	$p = .953$	.013	$p = .408$	.172
Protagonist Perception				
Heroic	$p = .117$	-.531	$p = .162$	-.460
Admirable	$p = .043$	.659	$p = .725$	.110
Morally correct action	$p = .697$	.083	$p = .892$	.028
Firefighter Perception				
Heroic	$p = .156$	.666	$p = .265$	.634
Helpful	$p = .236$	-.721	$p = .163$	-.827
Leader	$p = .884$	-.054	$p = .122$	.564
Admirable	$p = .183$	-.414	$p = .387$	-.261

Note: this table displays the significance and standardized B values for the possible covariates entered into the main analysis. Both self-beneficiary and other-beneficiary conditions are represented.

Table 6. Group Means for Protagonist Assessments

Group	Heroic		Admirable		Morally correct action	
	M	*SD*	*M*	*SD*	*M*	*SD*
Moral	5.97	1.15	5.81	1.23	6.34	1.15
Immoral	5.14	1.04	4.68	1.22	1.89	0.99
Morally Ambiguous	5.69	1.16	5.74	0.98	4.74	1.44

Note. This table includes mean ratings assessing the protagonist on three different criteria. Means and standard deviations for each item are represented by group.

Binomial Analyses

An exploratory analysis was conducted to further analyze the lies between and within groups by comparing the proportion of reported correct predictions with outcomes of a binomial probability density function. This function was utilized due to the nature of the data collected; although participants reported the sum of correct predictions, each iteration of throwing the die was binary: correct prediction or incorrect prediction. Therefore, a binomial probability density function was able to statistically determine the likelihood of 0-10 correct predictions out of 10 rolls.

Independent-Samples Kolmogorov-Smirnoff tests were utilized to statistically compare the distributions to the binomial probability distribution and to compare distributions between and within groups (see Table 7). Results of these K-S tests revealed that the distributions for the moral self-beneficiary and other-beneficiary, the immoral other-beneficiary, and the morally ambiguous self-beneficiary and other-beneficiary conditions were all significantly different from the binomial probability distributions, indicating that lies were likely present in each of these conditions. The immoral self-

beneficiary condition was non-significant. Comparisons between the group distributions were also non-significant, although the moral self-beneficiary and moral other-beneficiary distributions nearly reached significance, $p = .059$.

Table 7. Distribution Comparisons

	Binomial		Moral		Immoral		Morally Ambiguous	
	Self	Other	Self	Other	Self	Other	Self	Other
Moral	.010	.001	.059*		.982	.077	.521	.985
Immoral	.111	.005	.982	.077	.371*		.431	.227
Morally Ambiguous	.001	.001	.521	.985	.431	.227	.590*	

Note. This table shows the p-values of Independent-Samples Kolmogorov-Smirnov tests utilized to compare distributions. Values indicated with a single asterisk (*) are the results of Related Samples Friedman's Two-way ANOVA tests comparing self-beneficiary and other-beneficiary conditions within the same groups.

Comparison of binomial probability distribution and the moral, immoral, and morally ambiguous groups is represented in Figure 5. Trends in group behavior between the conditions are revealed in these distributions. Reports of correct predictions in the moral group increase overall between the self-beneficiary and the other-beneficiary conditions, with the peak shifting from 3 to 6 correct predictions, indicating a strong increase in larger lies for the other (see Figure 6). The immoral group experiences a slight

Figure 5. Binomial Probability and All Groups

This line graph displays the binomial probability of correct predictions out of 10

die rolls graphed against the reported correct predictions in all groups.

Confidence intervals for the binomial probability are 95%.

Figure 6. Binomial Probability and Moral Group

This line graph displays the binomial probability of correct predictions out of 10 die rolls graphed against the reported correct predictions in the moral group. Confidence intervals for the binomial probability are 95%.

shift in reported correct predictions in the other-beneficiary condition (see Figure 7), but not of the magnitude seen in the moral condition, indicating a slight increase in smaller lies for the other, which is offset by an overall decrease in larger lies. The reported correct predictions for the morally ambiguous group remains quite constant between conditions compared to the moral and immoral group distributions, with a sustained amount of moderate lies in both conditions (see Figure 8). These similar distributions indicate similar deceptive behavior between the self and other tasks in the morally ambiguous group.
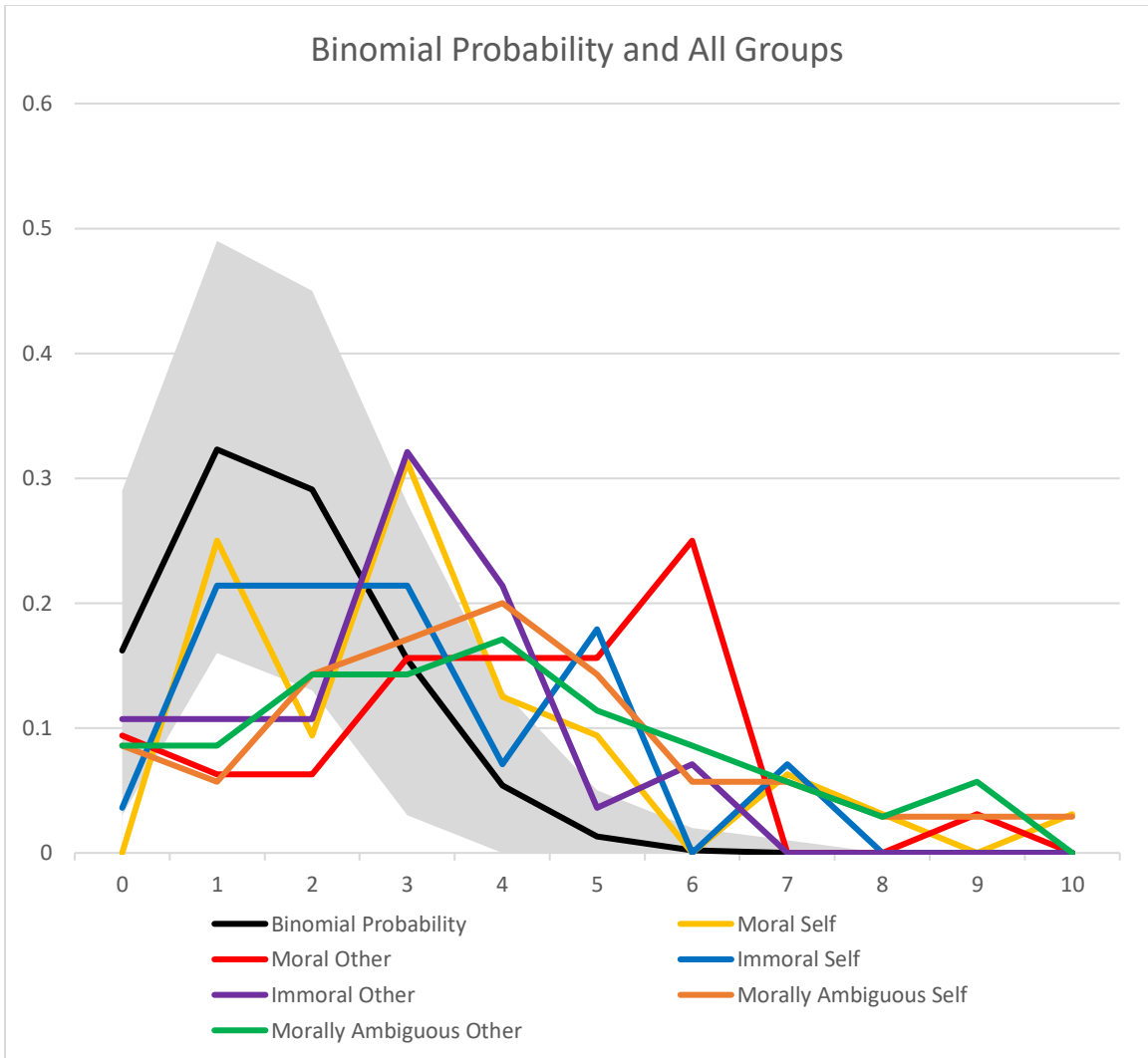
Figure 7. Binomial Probability and Immoral Group

This line graph displays the binomial probability of correct predictions out of 10 die rolls graphed against the reported correct predictions in the immoral group. Confidence intervals for the binomial probability are 95%.
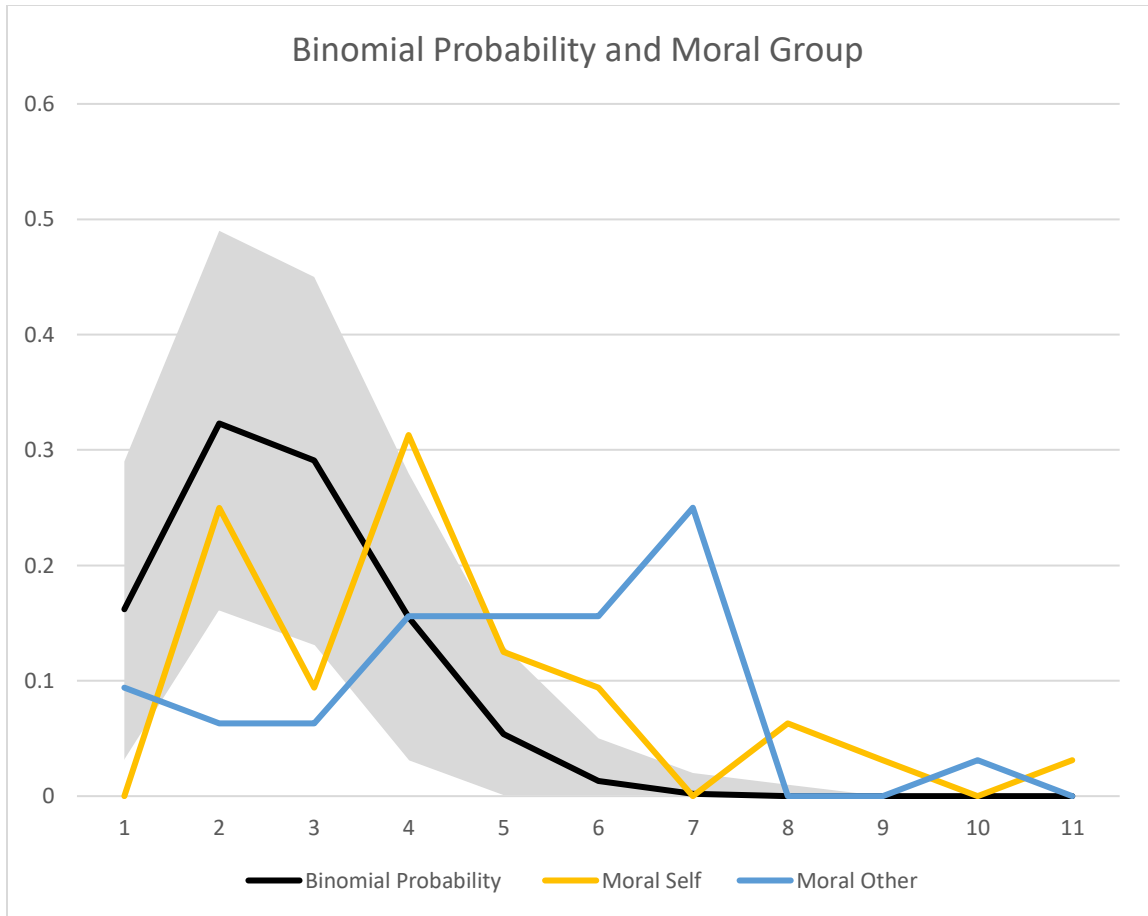
Figure 8. Binomial Probability and Morally Ambiguous Group

This line graph displays the binomial probability of correct predictions out of 10

die rolls graphed against the reported correct predictions in the morally

ambiguous group. Confidence intervals for the binomial probability are 95%.

This data was also analyzed to compare the cumulative binomial probability distribution against the cumulative reported data. In contrast with the binomial distribution, which reveals differences at individual data points, the cumulative binomial probability distribution highlights broader trends and percentile differences within the distributions. Comparison of the binomial probability distribution and the moral, immoral, and morally ambiguous conditions is represented in Figure 9. Figure 10 shows the immoral group most closely resembles the cumulative binomial distribution, indicating the least amount of lies and aligning with the cumulative binomial distribution at a lower threshold than the moral and morally ambiguous groups. Additionally, the moral and morally ambiguous distributions demonstrate further deviation from the cumulative binomial probability distribution overall, but in the morally ambiguous group the self-beneficiary and other-beneficiary distributions overlap and closely align, highlighting small differences in reports (see Figure 11). In the moral group, the self-beneficiary and other-beneficiary distributions contrast more than in either of the other two groups, showing the shift in behavior to report higher rolls for the other, but fewer extremely high rolls than in the self-beneficiary condition (see Figure 12).
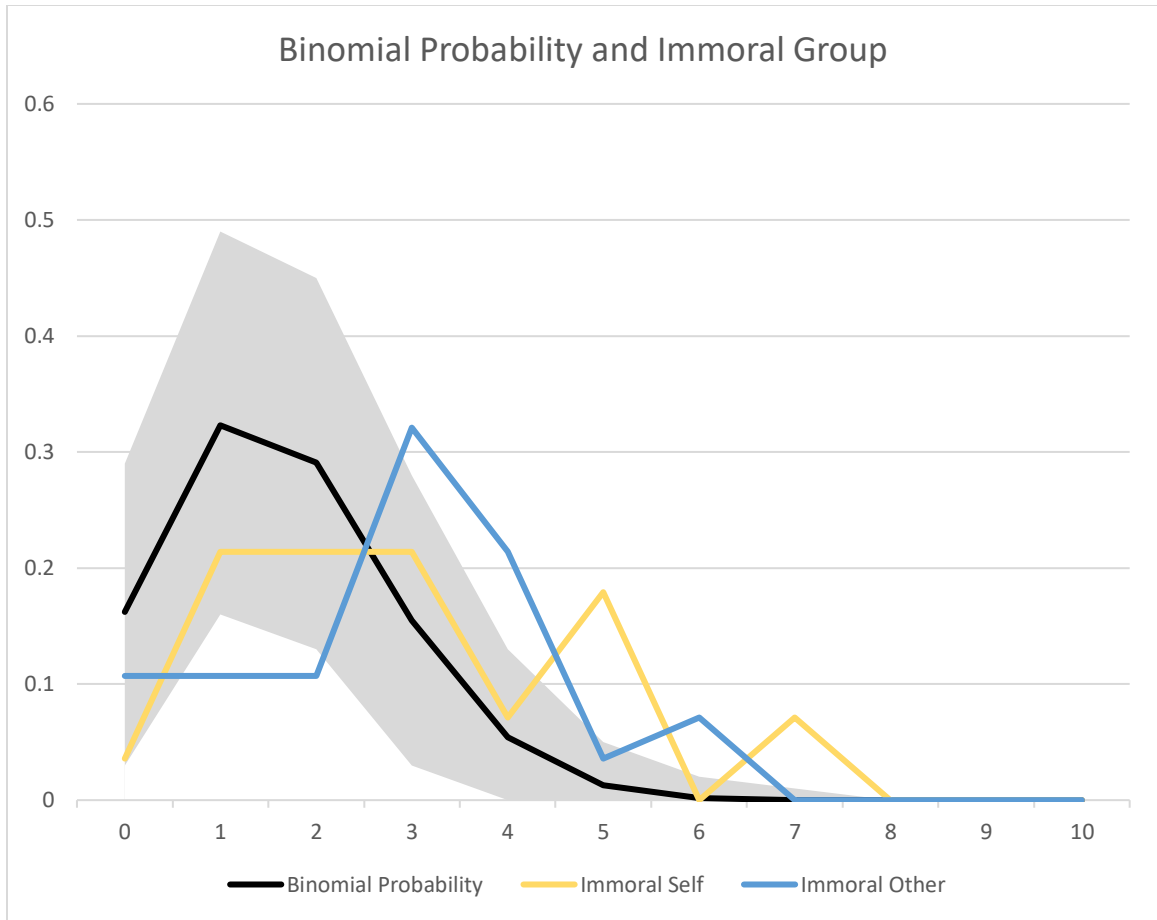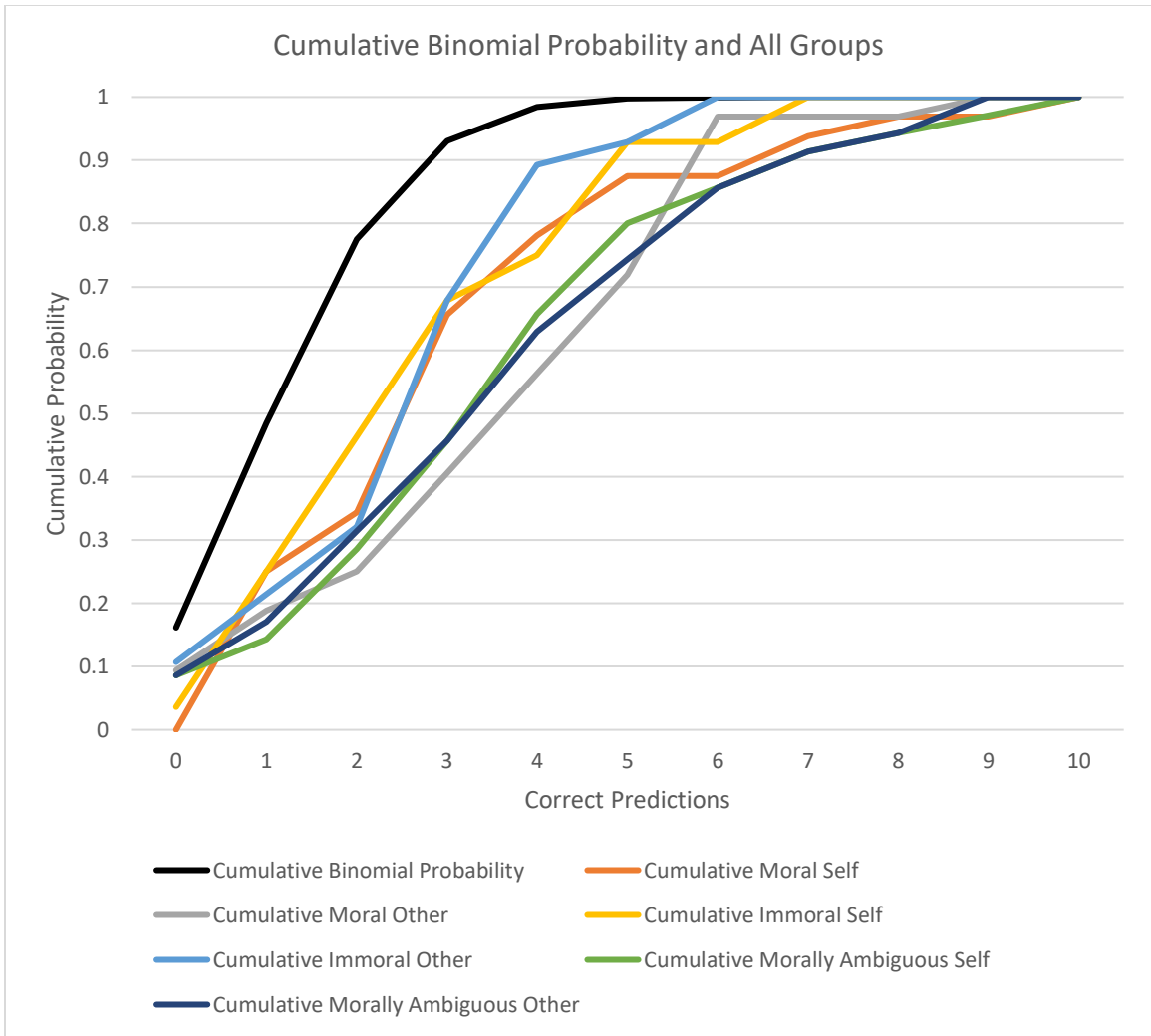
Figure 9. Cumulative Binomial Probability and All Groups

This line graph displays the cumulative binomial probability of correct

predictions out of 10 die rolls graphed against the cumulative reported correct
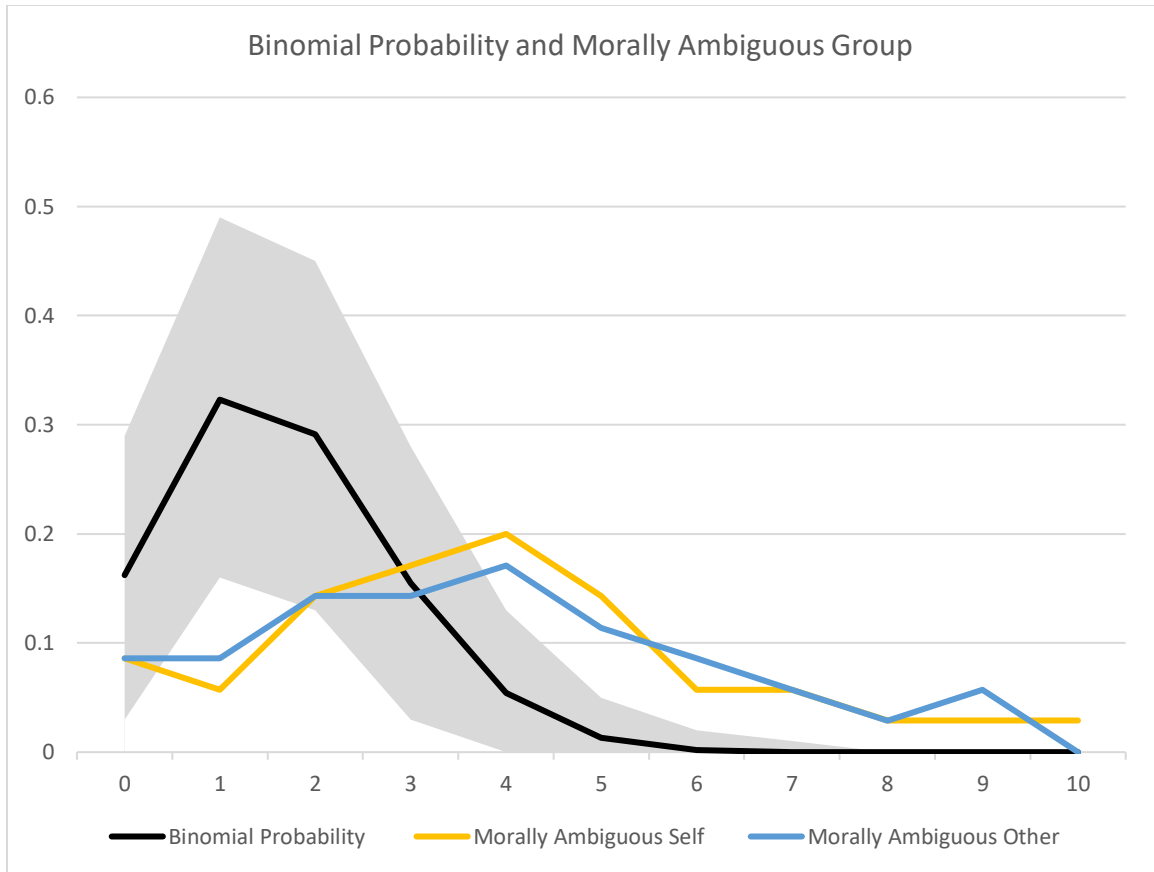
predictions in all groups.
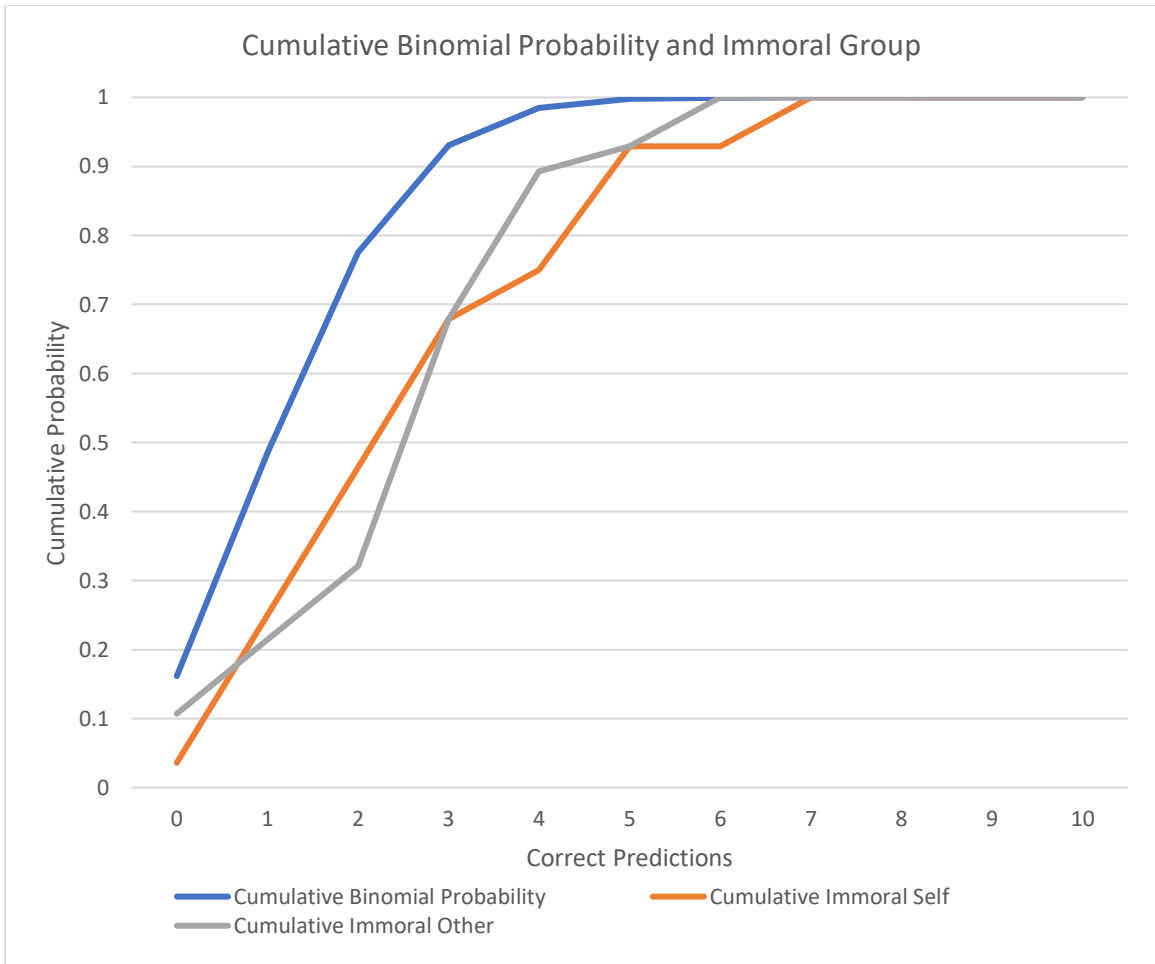
Figure 10. Cumulative Binomial Probability and Immoral Group

This line graph displays the cumulative binomial probability of correct predictions out of 10 die rolls graphed against the cumulative reported correct predictions in the immoral group.
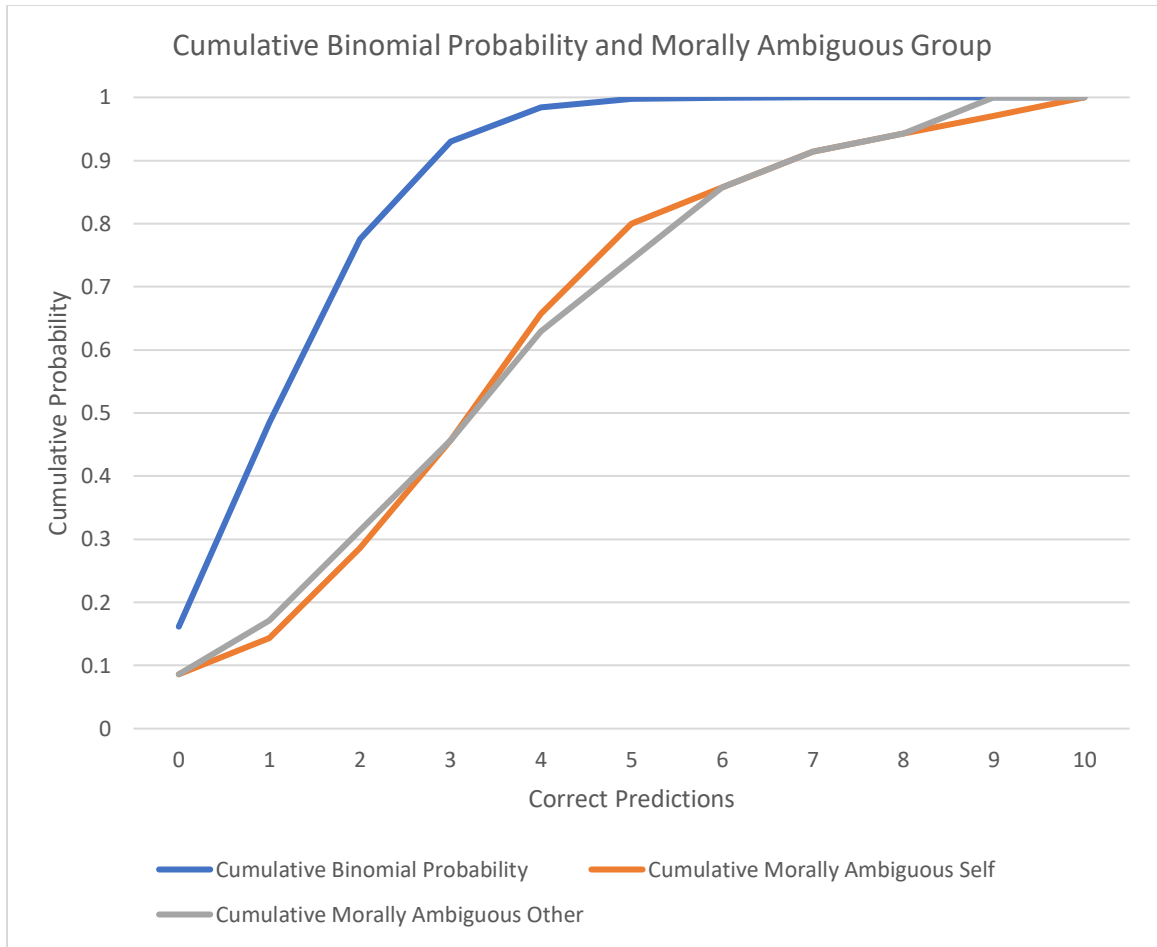
Figure 11. Cumulative Binomial Probability and Morally Ambiguous Group

This line graph displays the cumulative binomial probability of correct predictions out of 10 die rolls graphed against the cumulative reported correct predictions in the morally ambiguous group.
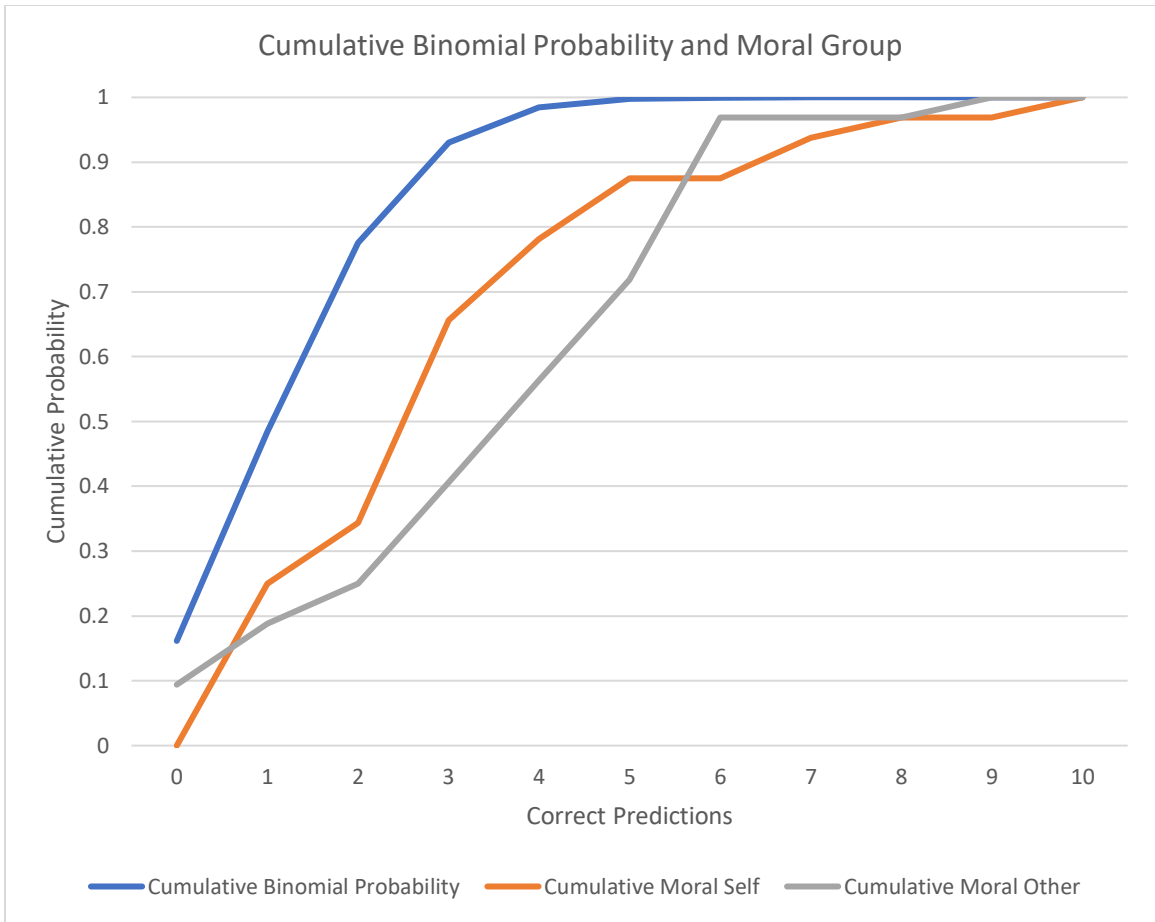
Figure 12. Cumulative Binomial Probability and Moral Group

This line graph displays the cumulative binomial probability of correct predictions out of 10 die rolls graphed against the cumulative reported correct predictions in the moral group.

Another exploratory analysis was conducted to remove the magnitude component from the data and evaluate reported rolls as a binary function of "lie" or "not lie." To determine the threshold for identifying a reported roll as a lie, the binomial probability density function was utilized again. This function calculated the statistical likelihood of

correct predictions out of a total of 10 die rolls (see Table 8). Using these probabilities, likely "lies" and likely "truths" were identified. 0-3 die rolls represented the highest statistical likelihood of correct predictions; approximately 93% of correct predictions are expected to fall within this range. The statistical likelihood of correctly predicting 4-10 die rolls decreased dramatically; 7% of correct predictions are expected to fall within this range with 5.4% represented by 4 correct predictions. Using these probabilities, reported correct predictions between 0-3 were considered likely "truths" and reported correct predictions between 4-10 were considered likely "lies" (see Table 9). Individual responses were evaluated to determine the rate of lies between groups and identify the frequency of lying in both conditions (see Table 10). A Chi Square test was utilized to further analyze the data. Overall, there was not a significant association between role model action and lying in the self-beneficiary condition, $\chi^2(2) = 4.04$, $p = .133$, or the other-beneficiary condition, $\chi^2(2) = 4.94$, $p = .084$. Crosstabulation identified two significant proportional differences within the data ($p < .05$). In the self-beneficiary condition, the proportion of lies in the morally ambiguous group was 48.7%, in contrast with 28.2% and 23.1% in the moral and immoral groups, respectively. In the other-beneficiary condition, the proportion of lies in the immoral group was 19.1%, in contrast with 40.4% in both the moral and morally ambiguous groups.

Table 8. Binomial Probability

Correct Predictions	Binomial Probability
0	0.162
1	0.323
2	0.291
3	0.155
4	0.054
5	0.013
6	0.002
7	$< .001$
8	$< .001$
9	$< .001$
10	$< .001$

Note. This table displays the binomial probability of total correct predictions from

0-10 out of 10 die rolls.

Table 9. Individual Reported Correct Predictions

MORAL				IMMORAL				AMBIGUOUS			
Self		Other		Self		Other		Self		Other	
1	T	4	L	0	T	3	T	0	T	1	T
1	T	1	T	1	T	1	T	0	T	1	T
1	T	4	L	1	T	3	T	0	T	0	T
1	T	2	T	1	T	4	L	1	T	2	T
1	T	3	T	1	T	1	T	1	T	2	T
1	T	4	L	1	T	4	L	2	T	3	T
1	T	2	T	1	T	0	T	2	T	3	T
1	T	0	T	2	T	0	T	2	T	3	T
2	T	0	T	2	T	2	T	2	T	2	T
2	T	3	T	2	T	2	T	2	T	5	L
2	T	3	T	2	T	3	T	3	T	5	L
3	T	3	T	2	T	0	T	3	T	1	T
3	T	6	L	2	T	3	T	3	T	6	L
3	T	5	L	3	T	1	T	3	T	2	T
3	T	1	T	3	T	4	L	3	T	0	T
3	T	4	L	3	T	3	T	3	T	9	L
3	T	6	L	3	T	3	T	4	L	5	L
3	T	0	T	3	T	2	T	4	L	6	L
3	T	1	T	3	T	6	L	4	L	8	L
3	T	6	L	4	L	3	T	4	L	3	T
3	T	4	L	4	L	4	L	4	L	4	L
4	L	3	T	5	L	3	T	4	L	4	L
4	L	6	L	5	L	3	T	4	L	7	L
4	L	5	L	5	L	3	T	5	L	6	L
4	L	6	L	5	L	4	L	5	L	4	L
5	L	5	L	5	L	5	L	5	L	4	L
5	L	5	L	7	L	4	L	5	L	3	T
5	L	6	L	7	L	6	L	5	L	4	L
7	L	6	L					6	L	4	L
7	L	6	L					6	L	2	T
8	L	9	L					7	L	6	L
10	L	5	L					7	L	5	L
								8	L	9	L
								9	L	7	L
								10	L	0	T

Note. This table displays individual reported correct predictions and coding as

truth or lies based on the probabilities identified in the binomial probability

density function.

Table 10. Frequency of Lies by Condition

Group	Participant Lies		Participants who lied in both conditions
	Self	Other	
Moral	34.4%	59.4%	31.2%
Immoral	32.1%	32.1%	17.8%
Morally Ambiguous	54.3%	54.3%	42.8%

Note. This table displays the percentages of detected lies by group. The threshold

for detecting lies was identified using the binomial probability density function.

Chapter IV

Discussion

The purpose of this study was to examine the impact of a role model's morally

ambiguous action on subsequent moral decision-making behavior in adolescents.

Participants completed two tasks to assess impact on behavior: one for the self, where

they could lie to improve their own chances of winning a gift card, and one for an other,

where they could improve a needy other's chance of winning a gift card. Hypothesis 1a

stated that exposure to a role model's morally ambiguous action will lead to less moral

behavior than exposure to an immoral or moral action when the behavior benefits oneself.

The results from this ANOVA did not reach significance, $p = .244$, so the null hypothesis

was not rejected.

Hypothesis 1b stated that exposure to a role model's morally ambiguous action

will lead to less moral behavior than exposure to an immoral or moral action when the

behavior benefits a needy other. Results of this ANOVA also did not reach significance,

$p = .057$, so the null hypothesis was not rejected. However, contrasts tests revealed a

marginally significant difference between the morally ambiguous and immoral groups in

this situation, $p = .049$. Independent Samples t-Tests were conducted to further illuminate

the relationship between groups, which revealed an additional significant difference

between the moral and immoral groups when given the opportunity to lie for another

person, $p = .043$, as well as an extremely non-significant result between the moral and

morally ambiguous groups in this situation, $p = .985$. These significant findings reveal an

interesting relationship between the groups, as the moral and morally ambiguous groups performed very similarly in this task, reporting approximately 1.02 more correct rolls on average than the immoral group. This may also explain why the overall ANOVA was not significant; the moral and morally ambiguous groups were not statistically different when given the opportunity to lie for the benefit of another person. Although the original hypotheses predicted greater levels of deceptive behavior in the ambiguous group over the immoral group, it did not predict the observed effect of similar levels of deceptive behavior between the moral and morally ambiguous groups when given the opportunity to lie on another person's behalf. There are several possible factors that may explain the results of these analyses.

The results in the other-beneficiary condition may be influenced by order effects. This research was most interested in participant behavior for the self, so for all participants the other-beneficiary task was presented second, after the self-beneficiary task had already been completed. The Pearson correlation for the self-beneficiary and other-beneficiary conditions showed a moderate positive relationship, indicating that reported correct predictions in one condition predicted a moderate increase of reported correct predictions in the other condition. However, if order effects were to fully account for this moderate relationship, then we would expect to see an increase in reported rolls in the other-beneficiary condition in all groups. While the moral group showed an overall mean increase in reported correct predictions between the self-beneficiary and other-beneficiary conditions, the morally ambiguous group mean remained constant in reported correct predictions, and the immoral group mean actually declined slightly. Therefore, order effects cannot exclusively explain the observed effects.

Potentially relevant to these findings may be positive affect (PA). PA is the experience of positive feelings and PA has been shown to increase lying and moral disengagement (Vincent et al., 2013). It is likely that the moral and morally ambiguous groups experienced more PA from reading the story than the immoral group due to the events of the story. Responses to the heroic assessment scale also indicate higher levels of PA in the moral and morally ambiguous groups. If PA fully explained the observed effects, lying for the self would likely have been elevated in the moral group, as it was for the morally ambiguous group. However, it is possible that a similar level of lying was not observed in the moral group for the self because of the events of the story. In the moral group, the protagonist told the truth and returned money that was not his, whereas in the immoral and morally ambiguous groups the protagonist took the money. This modeling may have counteracted the impact of PA in the first behavior task for individuals in the moral group, where participants were presented with a very similar situation of lying for oneself (Mecca et al., 2014; Moore et al., 2019). This modeling was not present in the morally ambiguous group, and therefore PA may have guided their behavior starting in the first behavior task.

Selfishness and altruism may have impacted participant behavior in these tasks. Research has shown that individuals are more likely to lie in a prosocial or altruistic situation, such as for the financial benefit of a charity or another person, rather than for themselves (Cojoc & Stoian, 2014; Levine & Schweitzer, 2014; Lupoli et al., 2017). This increase of lies for the benefit of another person is seen most strongly in the moral group, as 59.4% of individuals reported higher correct predictions for the needy other than they did for themselves, compared to 28.6% and 48.6% in the immoral and morally

46

ambiguous groups, respectively. The moral group was also the only group to increase their mean reported correct predictions in the other-beneficiary condition; the morally ambiguous group mean remained constant and the immoral group mean decreased. Results of the Related-Samples Wilcoxon Signed Rank Test showed much closer relationships between reported correct predictions in the self-beneficiary and other-beneficiary scenarios when individuals were exposed to a morally ambiguous or immoral action, rather than a moral one. This may indicate that exposure to an immoral or morally ambiguous action resulted in a more static moral approach to the tasks than the moral group; exposure to an immoral action may have discouraged dishonesty, while exposure to a morally ambiguous action may have licensed individuals to engage in dishonesty of all kinds, including selfish and altruistic. Therefore, this type of altruistic dishonesty may have only impacted individuals exposed to a moral action, leading to an overall increase in reported rolls only in this group.

Moral disengagement may also be a relevant factor. Participants in the morally ambiguous group may have morally disengaged upon reading the story, as their ratings of the role model's behavior suggest, and this disengagement may have spilled over into the die roll tasks (Liss et al., 1983; Gino & Galinsky, 2012). Prior moral disengagement may explain the consistent reported correct predictions for both self-beneficiary and other-beneficiary tasks. In contrast, within the moral group, where no moral disengagement would have been warranted by the story, participants may have only morally disengaged when they were faced with a situation that they could morally justify (Bandura et al., 1996; Bandura, 2002). Participants in the immoral group did not show indications of moral disengagement with either their behavior or the ratings of the role model's

behavior. It is possible that observation of an immoral action by the role model actually inhibited moral disengagement, making the participants' morals more salient and reducing the likelihood of disengagement (Bucciol & Piovesan, 2011; Mazar et al., 2008; Shariff & Norenzayan, 2007).

Overall, multiple factors may have influenced the behavior of the participants in conjunction, such as order effects, PA, altruistic dishonesty, and moral disengagement.

Covariates

This study identified two covariates from the data collected. Gender, ethnicity, socioeconomic status, and teacher were all non-significant. Age reached significance in the other condition with a positive B value, indicating that as participants increased in age their reported correct predictions also increased. A similar effect was found by Liss et al. (1983), who observed that older children were more willing to help another student, regardless of priming. A similar prosocial effect may explain this trend. Additionally, some studies suggest that emotional awareness and empathy may increase with age (Mankus et al., 2016; Olweus & Endresen, 1998), which may lead to a greater willingness to lie in the interest of another (Martins & Carvalho, 2013).

Responses to items concerning firefighters were also not significant when entered into the main analysis. Ratings concerning firefighters as role models indicated that participants held firefighters in very high regard and considered them role models. This confirms that a firefighter protagonist for the story manipulation was an appropriate choice for this population. However, this status was not sufficient to ensure participants continued to hold him in high regard after reading the events of the story. Perceptions of

the protagonist as heroic and admirable were moderately decreased in the morally ambiguous group and severely decreased in the immoral group compared to the moral group. Responses concerning the protagonist's heroic status and moral correctness of action were not significant, but perception of the protagonist's admirability emerged as a significant covariate in the self-beneficiary condition with a positive *B* value. This may indicate that if participants in the immoral and morally ambiguous groups were able to maintain a positive perception of the protagonist as an individual after witnessing him engage in an immoral and morally ambiguous action, then they were more likely to subsequently engage in deceptive behavior.

<div align="center">Binomial Distributions</div>

The first exploratory analysis utilized the binomial probability density function to evaluate reported correct predictions against the statistical likelihood of correctly predicting the die rolls. This analysis allowed for an identification of trends between groups in deceptive behavior. Evaluation of the data plotted against both the binomial probability and a cumulative binomial probability revealed some likely deceptive behavior across all groups, especially for 'smaller' lies; however, due to the sample size, the binomial probability distribution confidence intervals cover a wide range, and many observations in this range cannot be conclusively detected as lies.

The Kolmogorov-Smirnov tests revealed that the distributions of nearly all groups in both conditions differed from the binomial probability distribution, indicating that lies occurred in these situations. The only comparison that did not reach significance was for the immoral group when lying for the self; it is possible that lying was minimal or did not

occur in this situation. These tests further revealed that distributions between groups were not significant; this may be due to the presence of lying within nearly all situations and groups. The comparison of distributions within the moral group was the closest to reaching significance, $p = .059$, which may be indicative of the shift in behavior between the self-beneficiary and other-beneficiary situations that was not seen as strongly in the other groups.

These distributions indicate that those exposed to a moral action were the most varied in their behavior between conditions. Most of these individuals were either truthful or lied minimally when given the opportunity to lie for themselves, but when given the opportunity to lie for someone else honesty decreased and many participants lied moderately, with some lying minimally. Those lying severely or maximally decreased between the self-beneficiary and other-beneficiary situations in the moral group. These results highlight varied behavior in individuals who are exposed to a moral action, which is dependent upon the situation.

Those exposed to an immoral action exhibited less lying behavior overall, but their behavior did change based on the situation. When given the opportunity to lie for themselves, most individuals either told the truth or lied minimally, with some individuals lying moderately. In contrast, when given the opportunity to lie for another person, most individuals lied minimally or moderately, with fewer remaining honest or lying moderately. Some individuals increased their lying minimally when their behavior benefitted another person, while others still decreased their lying in this situation. Overall, individuals exposed to immorality refrained from lying severely or maximally.

These results seem to indicate that exposure to an immoral action leads to a small overarching effect of minimizing deceptive behavior.

Behavior among those exposed to a morally ambiguous action followed a very similar pattern when given the opportunity to lie for oneself or another. These two distributions are the most similar of all distributions in the sample. In both of these situations, most individuals lied moderately, with some lying severely or maximally, and some remaining honest. The similarity between the outcomes seems to indicate that observing a morally ambiguous action may result in a sustained, overarching effect on behavior that applies to multiple situations.

The second exploratory analysis of this study identified a statistical threshold for detecting a lie using the binomial probability density function. The data was recoded to represent "lie" and "not lie" and a Chi Squared analysis was conducted. These analyses also did not reach significance overall, but two statistically significant results did emerge. Given the opportunity to lie for one's own benefit, those who were exposed to a morally ambiguous action lied nearly twice as often as those in the moral and immoral groups. This result highlights an interesting trend that was not detected by the original ANOVA. This significant difference may be attributed to a number of causes. As previously stated, individuals exposed to a morally ambiguous action may have activated moral disengagement after reading the story, and this disengagement may have spilled over to the behavior task. High positive affect may have increased the participants' propensity to lie. Alternatively, those who witnessed a moral or immoral action may have been inhibited from lying for themselves. This analysis also found that when given the opportunity to lie for someone else's benefit, those who were exposed to an immoral

51

action lied less than half as often as those in the moral and morally ambiguous groups. This finding aligns with the significant finding from the original ANOVA, but demonstrates the significant decrease in lies from those who were exposed to an immoral action compared to a moral or morally ambiguous action.

Similarity of situation may also be a relevant factor in explaining these results. The two behavior tasks concerning self-beneficiary and other-beneficiary were reminiscent of the events of the story, but this similarity differed between groups. For the moral and immoral groups, the first behavior task for the self was more similar; in the moral story the protagonist returned money that was not his (told the truth) and in the immoral story the protagonist took money that was not his for his own gain (told a lie). Behavior in the self-beneficiary task was tangential for the morally ambiguous group, as a more similar situation was represented in the other-beneficiary task; in the morally ambiguous story the protagonist took money that was not his to give to a needy other (told a lie for a greater good). This difference between similar and tangential situations may account for some of the differences in group behavior. Participants exposed to a moral action may have been influenced to tell the truth in a similar situation, as this behavior was made salient by the role model (Gino et al., 2009). These same participants may have viewed the subsequent, tangential task for the other as separate from this guidance. They may have further interpreted lying for someone else as morally appropriate, even without guidance from a similar situation, having observed the role model helping others throughout the story. Participants exposed to an immoral action may have been dissuaded from lying in a similar situation through evaluation and rejection of the action taken by the role model (Gino et al., 2009). If lying was made

salient in the first task, it may have remained salient through subsequent tasks (Dolan & Galizzi, 2015). Participants exposed to a morally ambiguous action may have also lied more readily in the tangential task without a similar model for the behavior; then, having lied initially, participants may have more readily lied again in the subsequent, similar task (Garrett et al., 2016).

General Discussion

Moral ambiguity is a prevalent aspect of our lives, but its impact on moral decision-making is still an emerging field in psychology. This study adds to the growing understanding of moral ambiguity, specifically how it impacts adolescent moral-decision making. This study has shown that an observed morally ambiguous action has the potential to impact adolescent moral decision-making behavior. Furthermore, this study has attempted to contextualize the impact of moral ambiguity in relation to moral and immoral influences. Although not all analyses reached statistical significance, the trends in the data indicate that observation of moral ambiguity leads to less moral behavior compared to an observation of immoral behavior in both similar and tangentially related subsequent tasks. The relationship between moral and morally ambiguous observations is less clear. While observation of moral ambiguity seemed to elicit less moral behavior compared to observation of morality in a self-interested situation, this relationship failed to reach significance. Furthermore, behavior in an altruistic situation revealed similar behavior for both morally ambiguous and moral observations. The data provided by this study has revealed some potentially complex relationships between moral, immoral, and morally ambiguous influences, and this area certainly merits some further study.

These observations about morally ambiguous, moral, and immoral influences on adolescent behavior are specifically relevant in regard to role models. The actions observed in this study were not taken by random individuals, but by an individual who would generally be considered a role model in the sample population. This position of influence is likely tied to the trends and significant findings concerning subsequent moral decision-making behavior, although this cannot be confirmed since a manipulation without a role model was not utilized. The role model utilized in this study was familiar in terms of societal role (firefighter), but was not a familiar figure to the participants since the stories were created for use in this study. Even without prior familiarity with the role model, the actions he took influenced some subsequent moral decision-making behavior in the adolescent population. This effect is particularly interesting due to the wider implication of role model impact. Individuals in stories, on television, in politics, and in many other fields may be distant role models for adolescents, yet observation of their behavior has the potential to influence their moral decision-making behavior. This influence may go beyond imitation, and extend to tangentially related situations, as observed in this study. Further research into the reaching impacts of morally ambiguous actions taken by role models at different levels of closeness to adolescents may also be warranted to understand the full scope and magnitude of moral ambiguity and role models.

Research Limitations

Due to COVID-19 this study was conducted online in a survey format with no interaction from the researcher. This choice allowed the research to be conducted in a difficult climate, but it came with several challenges and limitations.

The lack of contact with the researcher may have been a large factor in the high exclusion rate. When individuals are in contact with the researcher, they can ask questions in real time, the seriousness and legitimacy of the study are communicated by the researcher's presence, and the researcher can assess the participant's level of engagement. All of those elements were lost by conducting this study online. 27 participants were excluded from the study for reporting total die rolls outside of the possible range. Most of these rolls indicated that participants may have been confused about the task (e.g., reporting 33 as a total; this participant may have added their rolls together instead of counting correct predictions). Another 42 participants were excluded from the study for failing to correctly answer 2 out of 3 comprehension questions about the die roll activity. This high number of exclusions from the comprehension questions may be due to a number of factors. Participants may have performed the activity correctly, but did not understand the context around the activity (what their predictions did, who they benefited, etc.). The comprehension questions may have been worded in a way that made correctly answering them difficult for this population. The comprehension questions were administered after both die roll tasks had been completed; it is possible that this was confusing for participants to recall which activity they completed first (self or other). The directions to the die roll tasks were detailed and reasonably lengthy; participants may have skimmed over them and not understood the full task. And finally,

the die-roll task was toward the end of the study and participants may have been experiencing fatigue when completing the die-roll tasks or answering the die-roll comprehension questions, leading to incorrect responses.

While these exclusions were necessary, they reduced the total number of participants from 166 to 95, which is below the desired sample size of at least 120. The high rate of exclusions was unexpected and likely impacted the statistical power of the study. Data analysis did still reveal some statistically significant effects, but a larger sample size would have increased the power of the study to detect smaller effects. This was especially apparent when examining the data; standard deviations in the ANOVAs indicated a large spread of the data, and confidence intervals were large, reducing the ability to identify statistically significant results in the data.

Further indication that a larger sample size is needed for this study was found in examining funnel debriefing questions. Responses revealed that some participants may not have been susceptible to the manipulation of this study because of predetermined, rigid morals concerning lying. Lying is a salient moral issue for many individuals, particularly children and adolescents since many children are taught explicitly not to lie. In the debriefing questions, when asked specifically about the die-roll task, some participants acknowledged that lying was possible, but they did not and/or would not lie. These types of statements indicate that lying is a protected value (Baron & Spranca, 1997; Marie, 2019) and this type of moral rigidity would cause these participants to behave honestly regardless of the group they were placed in. Logically, there were also likely participants who would lie regardless of the group they were placed in (although no one admitted to this in the debriefing questions). Randomization should account for these

always-honest and always-dishonest participants, which this study employed, but this noise was not accounted for in the study design in terms of sample size. The study already did not meet the intended minimum number of participants due to high exclusion rates, but it is very possible that an even greater number of participants would be needed in order to account for this always-honest/always-dishonest factor.

The nature of the behavior tasks may have also been a limiting factor in this study. The behavior tasks asked participants to make die-roll predictions, roll the die, and then self-report the outcome. Any individuals who chose to lie in this task would have been acutely aware of their choice to lie. As previously stated, some individuals have a strong aversion to lying and would not have taken an action even if they were influenced by the role model. In a different situation (i.e. one not concerning lying) or in a context where the behavior involved was not as obvious to the individuals (e.g. more complex or morally shrouded), it is possible that stronger relationships between role model and participant behavior would be found.

Although socioeconomic data was reported and run through the main analysis, it was likely not accurate. Since this study concerned adolescents who reported their own demographic information, the question used to assess socioeconomic status (SES) was "Do you receive free or reduced price lunch ($0.40)?" Nearly half of participants responded "I don't know" and after data collection for the study had started, the researcher became aware that due to COVID-19 all students were receiving free lunch this year, regardless of SES. Therefore, this question likely did not capture accurate data on SES in the sample and SES may still be a relevant factor in participant behavior that was not detected by this study.

Future Directions

This study found some evidence to suggest that adolescents are differentially impacted by moral, immoral, and morally ambiguous actions taken by a role model, and this impact can manifest in their behavior. Further research into this particular effect is needed, as the current study lacked statistical power. However, research into other related areas may be more fruitful overall.

This study utilized a distant role model for the experimental manipulation; the role model the participants read about derived his status from his profession (firefighter) and is an individual they had never encountered before. This study was able to detect significant effects even with a new, distant role model, but research into the impacts of morally ambiguous actions taken by closer role models would likely be revealing. Studies show that closer relationships have a stronger impact on emotions and perceptions (Chen et al., 2018; Venaglia & Lemay, 2017), so the influence of a morally ambiguous action may be magnified or more clearly detected when a closer role model is involved.

The current study also chose to expose participants to a morally ambiguous action through the medium of a text narrative. Statistical significance detected within the study demonstrates that actions taken within this medium do have the ability to influence adolescent moral decision-making behavior. Future research may focus on the impacts of other environments and mediums, such as film, audio, news reports, or real-life exposure. It is possible that different mediums of exposure may result in different impacts on behavior.

Evaluating different types of moral decision-making behavior may also be enlightening. In this study, participants were given the opportunity to tell lies to potentially improve their own situation or that of another person. This task was chosen to present participants with a similar or tangential situation to the one faced by the role model, but it is possible that exposure to a role model's morally ambiguous action may manifest very differently in behavior in a completely unrelated situation. Additionally, participants would have been aware they were lying in the behavior tasks in this study. These behavior tasks assessed adolescent behavior at a conscious level, but research into subconscious impacts may also be revealing.

This study also chose to assess impacts on subsequent moral decision-making behavior shortly after exposure to a moral, immoral, or morally ambiguous action, and does not capture any lasting impacts on moral behavior. Future research may benefit from assessing moral behavior in a longitudinal study to determine the overall salience and longevity of exposure to a role model's morally ambiguous action.

Finally, adolescents were the population of interest for this study, and some interesting observations were attained to support the idea that this population's behavior can be influenced by the moral, immoral, or morally ambiguous actions of a role model. Future research into the behavioral impacts of exposure to a role model's morally ambiguous action in different populations may be revealing.

Moral ambiguity is prevalent in our society in a variety of forms (Chambers, 2013; Johnson & Ecklund, 2016; Nyberg, 2008; Polatis, 2014; Shevenock, 2019; Thomas, 2005; Zwillich, 2018), and further research in this realm will help to uncover the temporary and lasting impacts it has on our behavior.

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Appendix A

Short Stories

Note: differences between the versions are highlighted in yellow.

Condition 1 - Moral Action

Clark was exhausted. It was 7 o'clock in the morning, and he hadn't gotten any sleep all night. Emergency after emergency had come up, and Clark and his team had hardly returned to the fire station and taken off their gear before they'd had to put it back on again and go out on another call.

The first call of the night had been a small house fire, where a young boy had tried to make a late night snack and set fire to the kitchen cupboards. Although the fire itself wasn't huge, it still produced an incredible amount of smoke. Clark ran in to find the boy's grandfather passed out in his bedroom. He'd rushed him out of the house and they'd performed CPR on him. This time it worked. The old man coughed a few times, and Clark knew he'd make it. The ambulance put him on some oxygen and Clark joined his team in putting out the fire.

The second call had been to a nursing home, where a woman had fallen on her way to the bathroom in the night. The woman couldn't walk, so Clark and his team maneuvered her onto a gurney to get her into an ambulance. Clark distracted her by asking her about her grandchildren and making lighthearted jokes. The woman had thanked Clark with tears in her eyes and Clark had promised he would go and check on her in the hospital when his shift was over.

The final call of the night was to another house fire. This one had been an electrical fire, and consumed the whole right side of the house before anyone had even

woken up. Fortunately, one of the parents awoke from her sleep, and managed to get everyone out of the house just in time. When Clark and his team arrived, they had the tremendous job of putting out the house fire before it spread any further. It was the dry season, and the house was surrounded by trees, which meant downed branches and brush. Clark and his team raced against the sunrise, which would bring in a swift breeze and turn the house fire into a wildfire. They managed to extinguish the flames and doused every ember with water, just to be sure a spark wouldn't cause a disaster later.

It had been an exhausting night, and Clark was looking forward to some sleep, but he needed to stay up a bit longer. After leaving the station, Clark stopped at a coffee shop to get himself some breakfast and some much needed caffeine. When Clark arrived, the shop was pretty busy. Clark stood in line and waited his turn, observing the people around him. Based on their dress, it was mostly people on their way to work—people in suits or skirts or khakis. There were also some teenagers who had met there on their way to school, and a few college students who were already hard at work on their laptops.

Clark ordered a latte and a breakfast sandwich, and then waited by the window for the barista to call his name. He stared absentmindedly out the window at the people passing by, but one caught his eye: a young boy carrying a stack of books. The boy couldn't have been more than 10 or 11, and the books looked very heavy in his arms. Clark noticed that they were textbooks: math, science, history, English. As the boy passed closer in front of the coffee shop window, Clark could also see the state of his clothes; they were stained with small holes in the places that got the most wear—his knees and his elbows. Just as the boy passed the door to the coffee shop, he tripped on a crack in the sidewalk that he hadn't been able to see because of the great stack of books

in front of him. The boy fell to the ground and his books scattered across the sidewalk. Clark immediately stood up, ready to help the boy gather his belongings, but two people on the sidewalk quickly went to the boy's aid. They helped him up and picked up his books for him. The boy thanked the two people and continued on, the stack of books weighing him down as much as before, but now he had a set of new scrapes on his knees.

"Clark!" the barista's voice called out. The sound of it echoed off the walls of the coffee shop. Clark turned to get his order and realized that the shop was no longer very busy. In the time it had taken them to make his order, most of the working people and schoolchildren had left. Clark went up to the counter and thanked the barista for his latte and sandwich. He made his way to the door, but was stopped by a voice that said, "Wait!"

Clark turned around to see the barista walking toward him. She held something out toward him and asked, "Did you drop this?"

Clark looked down at her hand and saw that she held a wad of cash. It looked like at least two hundred dollars, and Clark certainly hadn't dropped it. Clark never carried cash, preferring to pay for things with his credit card—there was something comforting to him about money that *couldn't* be burned up.

Clark looked at the barista and said, "No, that's not mine. Hopefully whoever dropped it will come looking for it."

The barista smiled and said, "Yeah, no problem," and took the money behind the counter.

Clark ate his breakfast sandwich in his car. As he sipped his latte, Clark felt a surge of energy from the caffeine. It would be enough to drive to the hospital and check on the old woman from the night before. Then, Clark would go home and sleep like a rock. And when he woke up, he'd head back to the fire station, ready to tackle whatever the world threw at him.

Condition 2 - Immoral Action

Clark was exhausted. It was 7 o'clock in the morning, and he hadn't gotten any sleep all night. Emergency after emergency had come up, and Clark and his team had hardly returned to the fire station and taken off their gear before they'd had to put it back on again and go out on another call.

The first call of the night had been a small house fire, where a young boy had tried to make a late night snack and set fire to the kitchen cupboards. Although the fire itself wasn't huge, it still produced an incredible amount of smoke. Clark ran in to find the boy's grandfather passed out in his bedroom. He'd rushed him out of the house and they'd performed CPR on him. This time it worked. The old man coughed a few times, and Clark knew he'd make it. The ambulance put him on some oxygen and Clark joined his team in putting out the fire.

The second call had been to a nursing home, where a woman had fallen on her way to the bathroom in the night. The woman couldn't walk, so Clark and his team maneuvered her onto a gurney to get her into an ambulance. Clark distracted her by asking her about her grandchildren and making lighthearted jokes. The woman had thanked Clark with tears in her eyes and Clark had promised he would go and check on her in the hospital when his shift was over.

The final call of the night was to another house fire. This one had been an electrical fire, and consumed the whole right side of the house before anyone had even woken up. Fortunately, one of the parents awoke from her sleep, and managed to get everyone out of the house just in time. When Clark and his team arrived, they had the tremendous job of putting out the house fire before it spread any further. It was the dry season, and the house was surrounded by trees, which meant downed branches and brush. Clark and his team raced against the sunrise, which would bring in a swift breeze and turn the house fire into a wildfire. They managed to extinguish the flames and doused every ember with water, just to be sure a spark wouldn't cause a disaster later.

It had been an exhausting night, and Clark was looking forward to some sleep, but he needed to stay up a bit longer. After leaving the station, Clark stopped at a coffee shop to get himself some breakfast and some much needed caffeine. When Clark arrived, the shop was pretty busy. Clark stood in line and waited his turn, observing the people around him. Based on their dress, it was mostly people on their way to work—people in suits or skirts or khakis. There were also some teenagers who had met there on their way to school, and a few college students who were already hard at work on their laptops.

Clark ordered a latte and a breakfast sandwich, and then waited by the window for the barista to call his name. He stared absentmindedly out the window at the people passing by, but one caught his eye: a young boy carrying a stack of books. The boy couldn't have been more than 10 or 11, and the books looked very heavy in his arms. Clark noticed that they were textbooks: math, science, history, English. As the boy passed closer in front of the coffee shop window, Clark could also see the state of his clothes; they were stained with small holes in the places that got the most wear—his

knees and his elbows. Just as the boy passed the door to the coffee shop, he tripped on a crack in the sidewalk that he hadn't been able to see because of the great stack of books in front of him. The boy fell to the ground and his books scattered across the sidewalk. Clark immediately stood up, ready to help the boy gather his belongings, but two people on the sidewalk quickly went to the boy's aid. They helped him up and picked up his books for him. The boy thanked the two people and continued on, the stack of books weighing him down as much as before, but now he had a set of new scrapes on his knees.

"Clark!" the barista's voice called out. The sound of it echoed off the walls of the coffee shop. Clark turned to get his order and realized that the shop was no longer very busy. In the time it had taken them to make his order, most of the working people and schoolchildren had left. Clark went up to the counter and thanked the barista for his latte and sandwich. He made his way to the door, but was stopped by a voice that said, "Wait!"

Clark turned around to see the barista walking toward him. She held something out toward him and asked, "Did you drop this?"

Clark looked down at her hand and saw that she held a wad of cash. It looked like at least two hundred dollars, and Clark certainly hadn't dropped it. Clark never carried cash, preferring to pay for things with his credit card—there was something comforting to him about money that *couldn't* be burned up.

Clark looked at the barista and lied, "Yes, that is mine. Thanks." It wasn't his money, but Clark decided he might want it more than whoever dropped it.

Clark ate his breakfast sandwich in his car. As he sipped his latte, Clark felt a surge of energy from the caffeine. It would be enough to drive to the hospital and check on the old woman from the night before. Then, Clark would go home and sleep like a rock. And when he woke up, he'd head back to the fire station, ready to tackle whatever the world threw at him.

Condition 3 - Morally Ambiguous Action

Clark was exhausted. It was 7 o'clock in the morning, and he hadn't gotten any sleep all night. Emergency after emergency had come up, and Clark and his team had hardly returned to the fire station and taken off their gear before they'd had to put it back on again and go out on another call.

The first call of the night had been a small house fire, where a young boy had tried to make a late night snack and set fire to the kitchen cupboards. Although the fire itself wasn't huge, it still produced an incredible amount of smoke. Clark ran in to find the boy's grandfather passed out in his bedroom. He'd rushed him out of the house and they'd performed CPR on him. This time it worked. The old man coughed a few times, and Clark knew he'd make it. The ambulance put him on some oxygen and Clark joined his team in putting out the fire.

The second call had been to a nursing home, where a woman had fallen on her way to the bathroom in the night. The woman couldn't walk, so Clark and his team maneuvered her onto a gurney to get her into an ambulance. Clark distracted her by asking her about her grandchildren and making lighthearted jokes. The woman had

thanked Clark with tears in her eyes and Clark had promised he would go and check on her in the hospital when his shift was over.

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passed closer in front of the coffee shop window, Clark could also see the state of his clothes; they were stained with small holes in the places that got the most wear—his knees and his elbows. Just as the boy passed the door to the coffee shop, he tripped on a crack in the sidewalk that he hadn't been able to see because of the great stack of books in front of him. The boy fell to the ground and his books scattered across the sidewalk. Clark immediately stood up, ready to help the boy gather his belongings, but two people on the sidewalk quickly went to the boy's aid. They helped him up and picked up his books for him. The boy thanked the two people and continued on, the stack of books weighing him down as much as before, but now he had a set of new scrapes on his knees.

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Clark looked at the barista and lied, "Yes, that is mine. Thanks." It wasn't his money, but Clark decided someone else might need it more than whoever dropped it.

The barista smiled and said, "Yeah, no problem," and she handed the money to Clark.

Clark took the money and rushed out the door. He ran in the direction the young boy had been walking in only moments before and caught up to him pretty quickly.

"Hey kid," Clark said, slowing down next to the boy who was struggling to balance his books. "I want you to have this." Clark held the money out in front of him, offering it to the boy.

"Why?" the boy asked, skeptically.

"Get yourself a backpack, and some new clothes," Clark said, still holding the money out in front of him.

With hesitation, the boy took it. "Thank you," he said.

"You don't need to thank me," Clark said. He smiled at the boy and then headed back to his car.

Clark ate his breakfast sandwich in his car. As he sipped his latte, Clark felt a surge of energy from the caffeine. It would be enough to drive to the hospital and check on the old woman from the night before. Then, Clark would go home and sleep like a rock. And when he woke up, he'd head back to the fire station, ready to tackle whatever the world threw at him.

Appendix B

How would you categorize Clark's behavior in regard to the $200? Use the scale below to evaluate his behavior.

Very clearly Immoral			Morally ambiguous			Very clearly moral
1	2	3	4	5	6	7

Appendix C

Distractor Task 1 (short answer; six minutes)

Write a short story about anything you want. You will have six minutes to write as much as you can.

Distractor Task 2 (short answer; 4 minutes)

Solve the math problems below. You will have 4 minutes to solve as many as you can. You may use a piece of paper and a pencil if you would like.

$64 \div 8 =$	2 x 1 =	6 + 8 =	$16 \div 8 =$	$16 \div 2 =$
$20 \div 4 =$	$8 \div 2 =$	3 x 4 =	1 + 8 =	3 + 6 =
4 + 9 =	2 x 1 =	$63 \div 7 =$	9 - 7 =	$18 \div 6 =$
3 + 4 =	6 + 7 =	$7 \div 1 =$	7- 7 =	7 - 3 =
4 - 3 =	1 x 3 =	6 x 1 =	5 + 3 =	8 x 3 =
$40 \div 5 =$	2 + 4 =	8 x 5 =	7 + 5 =	7 x 1 =
3 - 1 =	3 - 2 =	9 x 8 =	8 - 5 =	7 + 8 =
3 + 3 =	9 - 4 =	6 + 6 =	7 x 5 =	3 + 5 =
6 - 4 =	9 x 1 =	$63 \div 9 =$	8 x 9 =	4 - 3 =
$8 \div 9 =$	7 x 2 =	$3 \div 3 =$	4 - 3 =	8 x 24 =
16 + 32 =	10 x 11=	6 + 12=	$99 \div 9=$	16 - 13=
9 + 4=	$180 \div 9=$	19 - 15=	$27 \div 9=$	13 + 20=
$18 \div 6=$	$16 \div 1=$	3 + 5=	19 - 11=	$176 \div 16=$

76

15 - 7=	28 ÷ 2=	3 - 2=	20 - 17=	17 - 3=
7 x 19=	3 x 12=	70 ÷ 14=	4 + 10=	20 x 8=
19 - 7=	3 ÷ 3=	6 x 14=	13 x 7=	120 ÷ 10=
20 x 9=	6 x 16=	1 + 18=	45 ÷ 3=	15 + 6=
15 x 5=	6 x 12=	12 + 17=	4 x 9=	18 + 1=
14 - 1=	5 + 7=	15 + 7=	17 + 2=	16 - 12=
16 x 11=	16 - 9=	20 + 7=	4 x 11=	15 x 9=
16 x 2=	30 ÷ 6=	9 - 1=	17 - 11=	15 + 9=
5 x 4=	19 - 13=	5 x 12=	8 + 16=	19 x 11=
11 x 6=	30 ÷ 10=	2 + 19=	70 ÷ 10=	14 - 4=
15 - 9=	7 + 7=	15 x 12=	19 - 8=	221 ÷ 17=
5 + 8=	18 x 11=	18 x 12=	18 + 19=	15 + 12=
20 x 7=	126 ÷ 14=	11 x 8=	15 - 3=	11 - 7=
9 x 12=	13 + 10=	42 ÷ 7=	18 x 5=	20 - 18=
3 x 19=	15 + 8=	14 x 18=	5 - 1=	15 x 12=
1 - 1=	14 x 13=	18 + 19=	16 - 14=	8 + 14=
13 + 17=	5 x 11=	10 - 5=	10 - 2=	3 + 4=

Appendix D

Die Roll Task

Self-Beneficiary Condition:

Screen 1:

Thank you for your participation. You will now have the opportunity to play a game to enter a raffle for a $50 Amazon gift card. You can be entered into this drawing up to 10 times. The number of times you will be entered into the raffle will be based on your actions in the following activity.

In this next section, you are going to predict the outcomes of computerized random die rolls. You may not think that you have the ability to do this, and that's okay. Just do your best. You may be surprised at what you can do! Please read the instructions carefully.

Directions: Your task is to predict the outcome of the virtual die. You will roll the die 10 times. The die is "fair," which means each number should be equally likely.

Your chance of winning the $50 dollar Amazon gift card increases with each correct prediction, as you will be entered into the raffle one time for each correct prediction. For example, if you correctly predict 2 outcomes, then you will be entered into the raffle twice. But if you correctly predict 8 outcomes, then you will be entered into the raffle eight times. Whether or not your prediction was correct depends only on the prediction you made in your mind and the outcome of the die roll.

You are now ready to practice. First, you will make your prediction privately to yourself. Then press "ROLL" to roll the die. Then you will see the outcome of the die roll. At that point you evaluate whether the prediction you

made in your mind was correct. You may choose to take notes on your prediction

outcomes in the "NOTES" box.

You may practice using the die below. When you are ready to begin the

activity, press the arrow to move to the next screen.

Screen 2:   Step 1: Predict the outcome of the die roll

Step 2: Complete step 1 a total of 10 times. Remember to keep track of

your total number of correctly predicted die rolls (you may use the

"NOTES" section)

Step 3: Report the total number of correct predictions in the "TOTAL"

box

Other Beneficiary Condition:

Screen 1:

You will now have the opportunity to play the same game again. As before, there

is a raffle for a $50 Amazon gift card. But this time the gift card may go to a

needy member of our community, depending on how well you and your

classmates play the game. The person who might receive the gift card has already

been selected. To protect her privacy, we will call her "Jane". Jane is a real

person. She lives in _____ and is in her 70s. Jane has a low income and

suffers from some chronic health issues. In this next section, you are going to

predict the outcomes of computerized random die rolls again. The gift card will

only be donated to Jane if the total number of correct predictions from your class

reaches a certain number, which we have determined in advance, but that we are

not revealing. Overall, the odds of Jane getting the gift card are similar to your odds of winning the gift card in the previous activity.

Directions: Your task is to predict the outcome of the virtual die. You will roll the die 10 times. The die is "fair," which means each number should be equally likely.

Jane's chance of winning the $50 dollar Amazon gift card increases with each correct prediction. Whether or not your prediction was correct depends only on the prediction you made in your mind and the outcome of the die roll.

When you are ready to begin the activity, press the arrow to move to the next screen.

Screen 2:   Step 1: Predict the outcome of the die roll

Step 2: Complete step 1 a total of 10 times. Remember to keep track of your total number of correctly predicted die rolls (you may use the "NOTES" section)

Step 3: Report the total number of correct predictions in the "TOTAL" box

Appendix E

Heroic Assessment Scale (7-point Likert scale)

1. A firefighter is a hero.

2. A firefighter helps people.

3. A firefighter is a good leader in the community.

4. A firefighter should be admired by people.

For the following statements, think back to the story about Clark that you read earlier.

1. Clark is a hero.

2. Clark is an admirable person.

3. It was right for Clark to (refuse the money from the barista/take the money for himself/take the money to give to the needy boy).

Appendix F

Short Story Comprehension Check (multiple choice)

1. What was Clark's profession?

    a.   Policeman

    b.   Firefighter

    c.   Construction worker

2. Where did Clark go after getting off his shift?

    a.   Home

    b.   The mall

    c.   A coffee shop

3. What did Clark do when the barista asked if the money was his?

    a.   He took it for himself

    b.   He said it wasn't his

    c.   He took it and gave it to the boy

4. Where was Clark going at the end of the story?

    a.   To see the old woman in the hospital

b.   Back to work

c.   To see his daughter

Appendix G

Die Roll Activity Comprehension Check

1. In the previous activities, you were asked to predict die roll outcomes. What was the impact of correct predictions in these activities?

   a. Correct predictions increased (or improved) the odds of winning the gift card

   b. Correct predictions decreased (or reduced) the odds of winning the gift card

   c. I don't know

2. When you completed the first die roll activity, whose chances of getting the gift card were affected by your correct predictions?

   a. Me

   b. Jane

   c. I don't know

3. When you completed the second die roll activity, whose chances of getting the gift card were affected by your correct predictions?

   a. Me

   b. Jane

   c. I don't know

Appendix H

Funnel Debriefing Questions

1. What do you think was the purpose of this study?

2. Do you have an idea about what we were trying to measure? If so, what do you think it was?

3. Do you think reading the story may have affected your behavior in any of the other activities? If so, which one?

4. Did you think anything was strange about the die-rolling activity? If so, what?

Note: Two participants in this study (1.20%) were excluded for suspicion/detection of the outcome measure as identified by their responses to the funnel debriefing questions. Although some participants acknowledged an awareness of the opportunity to lie in the die-roll task in response to question 4, answers to the prior three questions did not indicate that this awareness constituted suspicion of the outcome measure or study design and therefore these individuals were retained in the analysis.