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The Effects of Mortality Salience on Decision Making Using a Framing Task

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Abstract

A large body of evidence shows that people's attitudes and behaviors change when their own death is made salient. However, very little research has examined whether mortality salience is related to decision-making. This is surprising given that emotions have been found to affect decision-making in many contexts. This study was designed to examine the effects of mortality salience on decision-making. Participants ($N = 148$, 74% female) were randomly assigned to one of two conditions. Participants in the control group were asked a series of questions about their reactions to a difficult exam. Participants in the experimental group were asked a series of questions designed to prime them with thoughts of their own mortality. Then, the participants were directed to the Asian Disease Problem questionnaire, a commonly used measure to assess the likelihood that people will make risky versus certain decisions when a choice is framed negatively versus positively. We used a chi-square analysis to examine how likely people were to choose the risky option in a positive or negative frame. Consistent with prior research on the framing effect, we found that participants in the control group exhibited a significantly higher preference for the risky option in the negative frame condition (70%) than in the positive frame condition (38%), $X^2(1) = 6.42$, $p = .01$. The framing effect did not emerge in the mortality salience group. That is, participants were no more likely to choose the risky option in the negative frame condition (51%) than in the positive frame condition (37%), $X^2(1) = 1.78$, $p = .18$. Indeed, participants in the mortality salience group appeared marginally more risk-averse in the negative frame condition than those in the control group, $X^2(1) = 2.99$, $p = .08$.

The Effects of Mortality Salience on Decision Making

Today the media is filled with messages intended to instill fear in people. We are exposed to these messages of fear in a variety of ways, and these messages inevitably evoke an emotional response. For instance, the top news stories are hardly ever about positive events. Instead, television executives and newspaper publishers frequently choose to headline stories about cancer, flu epidemics, natural disasters, and the like. Not only do we see these messages through the news media, we see these messages consistently throughout television programs in general. For example, messages of fear are common in hit series like *CSI*, *Law and Order*, and *1000 Ways to Die*.

Importantly, the fear that these messages are instilling is often a specific kind of fear related to death and dying. Exposing people to these specific types of messages is thought to increase mortality salience. Mortality salience is the activation of thoughts of one's own death, "which creates the potential for overwhelming terror" (Hart, Schwabach, & Solomon, 2010). Terror Management Theory (TMT) suggests that the anxiety stimulated by mortality salience leads people to cling to deeply held worldviews (e. g., the notion that people who violate the law should be punished) and to engage in behavior or to adopt beliefs that bolster their self-esteem (e.g., by favoring in-groups over out-groups).

To test TMT, there have been hundreds of studies in which mortality salience has been manipulated (Anaki, Brezniak, & Shalom, 2012; Routledge, & Juhl, 2012; Schindler, Reinhard, & Stahlberg, 2013; Wirth-Petrik, & Guenther, 2012). A typical manipulation is one in which participants are asked to write about what will happen to them when they physically die. Mortality salience has been linked to more favorable views of the use of torture by the

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government (Madabhushi, S. 2012), and an inclination to punish minor moral transgressions (Pyszczynski, Solomon, and Greenberg, 2003). In addition, mortality salience has been shown to increase greed and materialism (Hart et al., 2010), in-group bias, and racial bigotry (Greenberg, Pyszczynski, Solomon, Simon, and Breus, 1994).

It is evident that mortality salience can cause changes in people's attitudes and behaviors. What is less clear is how mortality salience affects people's responses on decision-making tasks. In the current study, our central goal is to contribute to the existing literature by examining how mortality salience might influence participants' decisions on a classic decision-making task called the Asian Disease problem. Here, participants are presented with a prompt:

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed; assume that the exact scientific estimates of the consequences of the programs are as follows.

Next, participants are asked to indicate their preference for a *certain decision* where there is a definite outcome (e.g., "400 people will die" or "200 people will be saved") or a *risky decision* where the outcome is less certain (e.g., "there is a 1/3 probability that no people will die" or "there is a 2/3 probability that no people will be saved"). Half of the participants are asked to make their decision when the options are framed positively (e.g., 200 people will be *saved*"), while half of the participants are asked to make their decision when the options are framed negatively (e.g., "400 people will *die*"). Prior research done by Tversky and Kahneman (1986) found that participants tended to be risk-averse in the "lives saved" condition (i.e. positive frame), but chose the more risky option in the "lives lost" condition (i.e. negative frame).

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According to the prospect theory, a loss is viewed as more significant than the equivalent gain (Peters and Levin, 2008). This “framing effect” has been documented in many subsequent studies (e.g., Cassotti, Habib, Poirel, Aïte, Houdé, and Moutier, 2012; Mishra, Gregson, & Lalumière, 2012; and Zhang, & Miao, 2008).

Studies have found that priming a particular emotion can influence the framing affect. For example, Cassotti et al. (2012) found that when participants were primed with negative emotions, or no emotions at all (control), they were affected by the framing manipulation. That is, when participants were primed with negative emotions they were more likely to choose the risky option (see also Leith and Beumeister, 1996). Interestingly, when participants were primed with positive emotions, the framing task no longer had an effect on their preference for the risky or certain option.

The Current Study

Thus, while there is clear evidence that emotions impact decision-making, only a handful of studies have looked at how the fear associated with mortality salience influences decision-making. Two studies that are particularly important for the present research have linked mortality salience to risky decision-making. A study conducted by Ben-Ari (2000) examined the effects of reminders of death on risk taking while driving. Findings show that induction of mortality salience led to more risky driving among individuals who perceived driving as relevant to their self-esteem. In interpreting these findings, the authors suggested that, when primed with thoughts of their own death, “people who perceive driving as relevant to their self-esteem may overemphasize the self-relevant gains involved in driving (validating one’s sense of mastery, improving social prestige), may pay little attention to potential dangers, and then may take more

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risks while driving” (Ben-Ari, 2000). While another study done by Hart et al. (2010) examined the effects of mortality salience on decision making during a gambling task. Mortality salience is said to increase feelings of anxiety and therefore lead to the pursuit of positive emotions to suppress these feelings. Hart et al. (2010) suggests participants, when primed with mortality salience, would pursue the more risky option if that heightens the chances for monetary reward or feelings of security. The results from their study show that this effect indeed happened and that the participants choose the risky option to possibly suppress their feelings of anxiety.

No prior studies, to our knowledge, have examined how mortality salience might influence participants’ decision on a framing task like the Asian Disease Problem. On the one hand, prior research on mortality salience and risk-taking would suggest that the induction of mortality salience would cause participants to choose the risky option more often than the certain option. However, it is important to note that neither of the prior studies that have examined links between mortality salience and risk-taking used the Asian Disease Problem, and both studies focused on thrill-seeking behaviors such as risky-driving and gambling. This led us to wonder whether the preference for risky decisions increases or decreases when people are asked to think about their own death? Indeed, it seems to us that the induction of mortality salience could cause participants to choose the certain option more often than the risky option because when made to think about their own deaths and then given a task to save someone’s life, the participants could be inclined to want to be more calculated in their decisions for others than for themselves. Leading us to the theory that the nature of the task would play a huge role in what decisions people decide to make.

We would also like to investigate how much the negative and positive frame affect the participant’s choice. Research has shown that the framing effect holds when negative emotions

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are primed. Due to these findings we used negative emotions for both of our conditions, taking a hard exam and the induction of mortality salience, but only one of the conditions makes one think about their own death; leading us to a more specific research question: Does the framing effect hold, increase, or diminish when people are asked to think about their own death? Prior research suggests that participants are more likely to choose the risky option when placed in the negative frame condition (e.g., “If Program C is adopted, 400 people will die”) as compared to the positive frame condition (e.g., “If Program A is adopted, 200 people will be saved”) (Cassotti et al., 2012; Mishra et al., 2012; and Zhang, & Miao, 2008).

Method

Participants

We had 148 participants. We posted a sign-up sheet on the psychology bulletin board at Hanover College, a small liberal-arts college in Indiana, in order to gather participants. We also posted a link of the survey on a well-known research website, *Psychological Research On the Net*, (Krantz, 2013) as well as a few social networking sites such as LinkedIn and Facebook. Participants were 82% Caucasian, 5% African-American, 3% Hispanic, 3% Asian, 7% other, 74% female, 26% male, and had an average age of 28. We will be using participants who are 18 and older.

Materials

We designed our own manipulation to induce thoughts of their own mortality among participants in our experimental, or mortality salience, group. We developed our idea by first researching how others had induced mortality salience. For example, we found that Bassett (2006) induced mortality salience by asking participants to write about their own death. We thought that our participants would take the thoughts of death a little more seriously if we put a

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spin on this one question and really structured their thoughts about death. That is, we really made them think about their own death by giving them the scenario: “If you died tomorrow, an unexpected death, how would you answer the following questions about your funeral?” Next, participants were asked a series of eight questions, including: “Where would you want your mother to sit?” and “What would your last words to your parents be?” We asked these tough questions in hopes of really tapping into the thoughts of death and dying (see Appendix for a complete copy of mortality salience questionnaire). Participants in the control group received a similar eight item questionnaire, only this time participants were asked to consider the following scenario: “Remember a time you took an extremely hard exam, how would you answer the following questions about this exam?” Questions included: “What grade did you receive on this hard exam?” and “What did you feel during the hard exam?” (see Appendix for a complete copy of hard exam questionnaire). The hard exam questionnaire was used as a control because both conditions induce negative emotions, but only the mortality salience, or experimental, condition induces negative emotions about death. After completing either the mortality salience questionnaire or the hard exam questionnaire, participants were directed to complete a portion of the Asian Disease Problem. Mishra and Fiddick (2012) and Tversky and Kahneman (1981) as well as several others have used the Asian Disease Problem to address the topic of risky versus certain decision making (see Appendix for a complete copy of the Asian Disease Problem). We also used a demographic sheet to measure age, ethnicity, and gender.

Procedure

Before beginning this experiment, participants were required to sign an informed consent giving their permission to participate in this study (see Appendix for complete copy of informed consent). We told participants that this was a study designed to examine how people make

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decisions. We explained that the study would involve completing a brief questionnaire. After participants completed their informed consent forms, they filled out a demographics sheet asking their age, gender, and race. Participants were then randomly assigned to one of two conditions: the control group in which participants were asked a series of questions pertaining to a difficult exam, or the experimental group (mortality salience) in which participants were asked a series of questions designed to prime participants with thoughts of their own mortality. Then, the participants were directed to the Asian Disease Problem questionnaire, where they received either the positively framed set of questions, or the negatively framed set of questions. The assigning of the positively framed set of questions and the negatively framed set of questions was completely random. It took participants, on average, 15 minutes to complete the questionnaire. Finally, the participants were debriefed and dismissed (see Appendix for complete copy of debriefing form). Participants were offered a copy of the debriefing form following dismissal.

Results

We used a chi-square analysis to examine how likely people were to choose the risky option in a positive or negative frame. Separate analyses were conducted for the control (i.e., hard exam) and experimental (i.e., mortality salience) groups. Results are shown in Figure 1.

We predicted that participants in the hard exam group would be more likely to choose the risky option when they were randomly assigned to the negative frame condition as compared to the positive frame condition given prior research that has shown that the framing effect holds when negative (but not positive) emotions are primed. Consistent with our hypotheses, we found that participants exhibited a significantly higher preference for the risky option in the negative frame condition (70%) than in the positive frame condition (38%), $X^2(1) = 6.42, p = .01$.

Although there is a dearth of relevant research on the effects of mortality salience on the framing effect, prior research on the effects of mortality salience on risk-taking suggested that the framing effect might be even stronger among the mortality salience group. The results of the current study did not support this prediction. Instead, the framing effect went away in the mortality salience condition. That is, participants were no more likely to choose the risky option in the negative frame condition (51%) than in the positive frame condition (37%), $X^2(1) = 1.78$, $p = .18$. In fact, if anything in the mortality salience condition, participants became more risk averse in the negative frame (70% compared to 51%), $X^2(1) = 2.99$, $p = .08$. There was no change in the positive frame (37% compared to 38%), $X^2(1) = 0.02$, $p = .88$.

Discussion

As predicted, our results show that the framing effect held true in the hard exam condition. Previous research has also found that when participants are primed with negative emotions the framing effect holds (Cassotti et al., 2012). The hard exam condition was used to prime for a negative emotion and therefore supports prior research and can be used as a control against the mortality salience condition.

Past experimenters have studied the comparison of the framing effect between positive and negative emotions, where we were investigating a more negative state of emotion, mortality, versus a negative emotion. Studies have suggested that because mortality salience is a negative emotional state the framing effect should be present or even increase as it does in other negatively primed emotions (Cassotti et al., 2012). Interestingly, we found that the framing effect went away in the mortality salience condition.

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In addition to determining how mortality salience might impact the framing effect, we set out to examine whether priming mortality salience might influence preference for risk using the Asian Disease Problem. Prior research lead us to think that there would be a higher chance of participants choosing the risky option over the certain option in the negative frame, but not in the positive frame (Tversky and Kahneman, 1986). It was thought that participants being primed with such a negative emotion on top of being placed in the negative frame would cause them to choose the risky option over the certain option to suppress their feelings of anxiety created by the mortality salience (Hart et al., 2010). Throughout our study we have found that this was not supported and participants were actually less risky when primed with mortality salience than when primed with a hard exam in the negative frame. Even more interesting, our results show participants in the negative frame of the mortality salience condition were more risk-averse.

Our findings combat that of previous research and although this is very interesting we have thought of reasons why this may have occurred. Previous studies that have examined the effects of mortality salience had their participants perform tasks that are more self-oriented. Hart et al. (2010) and Ben-Ari (2000) have looked at the effects of mortality salience on thrill-seeking type tasks such as gambling and risky-driving. We, on the other hand, used the Asian Disease Problem as the task completed by the participants, which has not, as far as we know, been used before. This task makes participants choose between saving/killing other people, which is not a task that only affects themselves but others. Gambling is usually something people do for entertainment, and the overall general experience would be seen as a positive one, whereas being asked to save/kill a probability of people or a specified number of people would arouse some generally negative emotions on top of the prime of the negative emotions we induced in our

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study. We believe that because this task was so different from previous tasks used when examining mortality salience, it is not so strange that our results greatly differed.

After examining our study, we have found that some improvements need to be made to the overall execution of the study. While examining the feedback on the conditions the participants were placed in we found that some participants placed in the hard exam condition did not know how to respond to the questions being asked. Some people taking the questionnaire had not been in school for a long period of time or had not finished school and therefore did not remember what their hardest exam was and what grade they received. Because the participants were unable to answer these questions they may not have felt the negative emotions that the condition was supposed to create. For future research, we suggest using a more versatile questionnaire that would generate negative emotions in almost anyone.

Another limitation found within our study is the effects of mortality salience in relation to one's thought of their own family. Questions used in the mortality salience condition questionnaire were, "where would you like your mother to sit," and "what would the last words to your parents be." These questions not only induced thoughts of one's own death but also induced feelings of losing one's family members; which in turn could have affected the decisions made by the participants. Because they were now thinking about losing their families they may have chosen the more certain option to suppress those negative feelings and have a more soothing option of saving people's lives.

Lastly, our study had a lot more female participants (74%) than male participants (26%). Previous research has shown that males tend to partake in more risky behaviors than females (Gil, 2005; Pawlowski, Atwal, & Dunbar, 2008; and Leijenhorst, Westenberg, & Crone, 2008).

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This fact may not have mattered to our overall results but it would be interesting to see in future research if the number of males to females were more equal would the decision to choose more risky options increase in either condition.

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Appendix

Experimental Group: Mortality Salience

If you died tomorrow, an unexpected death, how would you answer the following questions about your funeral?

1. What color casket would you want?
2. Who would you want pallbearers to be?
3. Where would you want your mother to sit?
4. What would your last words to your parents be?
5. Would you want people to wear certain colors (for example, black/white)?
6. Would you want to be dressed formally or casually?
7. Would you want to be cremated?
8. If buried, what would you want written on your head stone (for example, Name, Loving son of your parents)

Control Group: Hard Exam

Remember a time you took an extremely hard exam, how would you answer the following questions about this exam?

1. What class was your hard exam in?
2. How much did you study for this hard exam?
3. What grade did you receive on this hard exam?
4. Who was the teacher who gave the hard exam?
5. What did you feel during the hard exam?
6. How confident did you feel after this hard exam?
7. What was your stress level going in/ studying for this hard exam?
8. Did you receive the overall grade you wanted in the class that this hard exam was in?

Asian Disease Problem Questionnaire:

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed, assume that the exact scientific estimates of the consequences of the programs are as follows.

1. If Program A is adopted, 200 people will be saved.
 2. If Program B is adopted, there is 1/3 probability that 600 people will be saved and 2/3 probability that no people will be saved.
-
1. If Program C is adopted, 400 people will die.
 2. If Program D is adopted, there is 1/3 probability that no people will die and 2/3 probability that 600 people will die.

Informed Consent Form

This research is being conducted by Samantha Nicholas and Khrys Nugent, students in the Advanced Research Psychology course at Hanover College. The experiment in which you are asked to participate is designed to examine how people make decisions. You will be asked to fill out a demographic survey, as well as a brief questionnaire. After you have finished answering all the questions, you will be debriefed.

The entire experiment will not take more than 15 minutes. You'll want to pilot test to make sure. There are no known risks involved in being in this study, beyond those of everyday life. The information you provide during the experiment is completely anonymous; at no time will your name be associated with the responses you give. If you have any questions about what you will be doing in the study or about the study itself, feel free to ask them now or at any other time during your participation.

If you have any questions now or after the study, please contact:

- For questions about the research itself, you may contact the researchers: Samantha Nicholas at nicholass13@hanover.edu and Khrys Nugent at nugentk13@hanover.edu.
- For questions about your rights as a participant in this research, you may contact the faculty member supervising the research, Dr. Ellen Altermatt, at altermattel@hanover.edu, or the chair of Hanover College's Institutional Review Board, Dr. Bill Altermatt, at altermattw@hanover.edu.

Participation in this study is voluntary. Refusing to participate or ceasing to participate at any time will involve no penalty. Please inform the researchers if you would like to keep a copy of this informed consent form.

Signature

Date

Debriefing Form

The study in which you just participated was designed to measure the effects of mortality salience on decision making. You were either placed in the control group where you were asked a series of questions pertaining to a difficult exam you have taken in the past or you were a participant in the experiment group where you were asked a series of questions designed to prime you with thoughts of your own death. In both the control and experimental groups you were then asked to answer a brief questionnaire.

We will be studying the effects of mortality salience on decision making using a framing task. More simply, we want to know if priming participants with their own death affects their likelihood of making risky or certain decisions.

Please do not discuss this study with other potential participants until the semester is over. If people know what we're testing before the study begins, they may respond differently, jeopardizing our results.

If you have any questions, please contact:

- For questions about the research itself, you may contact the researchers: Samantha Nicholas at atnicholass13@hanover.edu and Khrys Nugent at nugentk13@hanover.edu.
- For questions about your rights as a participant in this research, you may contact the faculty member supervising the research, Dr. John Krantz, at krantzj@hanover.edu, or the chair of Hanover College's Institutional Review Board, Dr. Bill Altermatt, at altermattw@hanover.edu.

Figure 1. The Effects of Mortality Salience on Decision Making Using a Framing Task

A chi-square analysis revealed participants exhibited a significantly higher preference for the risky option in the negative frame condition than in the positive frame condition, $X^2(1) = 6.42, p = .01$. We also found the framing effect went away in the mortality salience condition, $X^2(1) = 1.78, p = .18$. In fact, if anything in the mortality salience condition, participants became more risk averse in the negative frame, $X^2(1) = 2.99, p = .08$. There was no change in the positive frame, $X^2(1) = 0.02, p = .88$.

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