

MORTALITY SALIENCE, CONSIDERATION OF FUTURE CONSEQUENCES AND
BEHAVIOR IN A COMMONS DILEMMA

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ABSTRACT

When a resource is limited, it may be depleted by individual users acting in a rational, self interested way. The same resource might be sustained if the users act collectively so as to restrain their consumption for the common good. Such a resource situation constitutes a dilemma, a resource or commons dilemmas resulting from a conflict in self and community interests. Sometimes the dilemma is also viewed as a conflict between short term and long term interests. Examples of commons dilemmas are the harvesting of trees in the forest and fish in the oceans. Environmental influences such as exposure to mortality and individual difference variables such as consideration for the future consequences of one's actions have been theorized to impact the amount of cooperative behavior (as opposed to self interested-behavior) in commons dilemmas.

It was hypothesized that mortality salience would increase consumption and donation behavior within commons dilemmas simultaneously. It was further hypothesized that cooperative behavior within a commons dilemma would be predicted by higher amounts of the construct of consideration for future consequences. Participants were assigned to either a mortality salience or control condition. They also completed a measure of consideration of future consequences, and participated in commons dilemma simulations. Death related constructs were more readily available for participants in the condition exposed to the mortality salience manipulation of watching a short news clip. Participants in this condition also consumed significantly more resources and donated significantly more money in commons dilemma situations. A measure of consideration

for future consequences was found to be a useful tool in predicting donation behavior in a commons dilemma (under the control condition) but was not found to be effective in predicting the amount of consumption within a resource dilemma.

This research constitutes the first time a mortality salience manipulation has been found effective at Humboldt State as well as the first time mortality salience has been tested with multiple types of dilemmas simultaneously. Consideration of future consequences was also suggested as an individual difference impacting behavior within commons dilemma situations.

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INTRODUCTION

Environmental psychology can be defined as the study of the transactional relationship between individuals and their physical settings (Gifford, 2007). Highlighted by this definition is the concept of transaction, the concept that the environment has an impact on an individual's behavior and experience while the environment is also changed by the individual's actions. This transactional relationship between individuals and the environment may be better understood by investigations of dilemmas (Dawes, 1980), especially with aspirations to improve our relationship with the environment and the quality of the environment itself.

Imagine the following situation as if it were happening to you. You make your living by commercially fishing yellow perch on Lake Michigan. Lately, it has become harder and harder to make ends meet in the fishing industry because of falling prices for fish and declining fish populations, yet you are still making a decent living. The State Department of Natural Resources (DNR) reports that the current rate of fishing yellow perch is not sustainable. If changes are not made to limit individual catches, the perch population will no longer be able to support commercial fishing and the DNR will be forced to prohibit all fishing of yellow perch. The DNR predicts that the forced prohibition of all fishing is likely to occur during your lifetime.

You would have to decide whether you would be willing to limit the number of fish you would personally harvest if you actually were in this situation (adapted from Kortenkamp & Moore, 2006). You might even consider abandoning your

fishing occupation entirely. You may wonder what the impact of over fishing may ultimately have on the fish population, and more broadly, on the ecology of the lake. These considerations demonstrate some of the transactional elements of the relationship between individuals and their environment. Individual decisions here impact the environment which in turn impacts the individual. This example highlights the key concepts that are central to a commons dilemma.

REVIEW OF THE LITERATURE

Commons Dilemma Situations

A commons can be defined as a desirable resource that is shared between individuals in a group (Gifford, 2007). Examples of commons are animal diversity, sunlight, and the ozone layer. It should also be noted that some of these commons renew themselves instantly or rather quickly in geological terms such as sunlight while others require a much longer time to replenish like the ozone layer. Other commons never recover from depletion; examples include species of animals that are now extinct as a result of human action resulting in a ripple effect through the ecosystem and decreasing species variety for human medical research. A behavior that benefits the individual is often in opposition to what will benefit both the commons itself and other individuals who rely on the commons. In illustration of this point, consider the benefits of driving a personal vehicle and the cost of air pollutions to the environment and society. The individual is gaining from personal convenience at the cost of lower air quality.

The terms private and public interest are often used to distinguish these conflicting choices that occur within a dilemma. Private interest refers to actions that benefit the individual while public benefit refers to actions that benefit the total group of individuals reliant on the commons and the commons itself (Gifford, 2007). Various approaches attempt to understand individual and group level responses in a commons dilemma. Simulated resource dilemmas have been a means of investigation in these lines of research for nearly 30 years (Dawes, 1980). These simulations take more traditional

approaches such as games simulated on a chalk board involving harvesting of trees (Porter, 2007) and computerized simulations such as fish harvesting (Gifford & Wells, 1991).

To better understand the conflict between private and public interest and how these concepts are measured in research, consider the following simulation design (Gifford & Hine, 1997a) utilized by Porter, 2007. Groups of three participants were seated in a class room so as not to sit next to each other in the front row. The researcher drew a grid to represent points that could be earned during various rounds of harvesting and explained the instructions of the game. Fifteen points representing trees were available in the resource pool for participants to harvest. Individuals told the researcher how many points they wanted to harvest by holding up cards visible only to the researcher. Each point that the participant harvested was redeemable for one entry into a drawing for prizes totaling over \$50. If the group completely depleted the resource, then none of the participants received any entries into the drawing. After each round of harvesting, the researcher subtracted the total number of points harvested from the commons and then added 50 percent of the points remaining to simulate natural regeneration. In this way, if all participants harvest the maximum number of points for the first two rounds, the commons would be depleted. Participants were individually motivated to harvest in order to receive more drawing entries and motivated to preserve the resource for the public benefit of being able to enter the drawing at all. Various factors within this simulation design can then be controlled for or compared to other

conditions such as the number of harvesters, the amount of the resource at the outset and the rate of regeneration (Gifford & Hine, 1997b).

The central tenet of the commons dilemma involves the overuse of a resource resulting in conflict between individual and group interests (Hardin, 1986). It should be noted that the commons dilemma is often referred to as a resource dilemma. The collection of individuals acting in a rational, self interested way often results in the dilemma that the resource will be completely depleted so everyone involved would benefit from cooperation. In the example used previously, if everyone were willing to limit the catch of yellow perch, all could profit (albeit to a limited extent), but only if everyone agreed to limit his or her harvest to a sustainable level. The dilemma here is that individuals stand to gain more by maximizing their own personal gain by competing for maximum harvest rather than by showing cooperative restraint. The collective result is over harvesting with the ensuing negative consequences for all (commons depletion).

The discussion up to this point has centered on dilemmas in which individuals have harvested or “take out” from the resources in the commons. Other situations exist where the fate of the commons depends on individuals “putting in” something to the commons such as time or money (Gardner & Stern, 2002). An example of such a situation is a public radio station dependent on individual contributions. In this dilemma, the public radio station needs individual listener contributions to keep operating expenses covered. Without contributions from individual listeners, the radio station cannot remain in operation for all to enjoy. The example of driving an inefficient vehicle can be seen as a “putting in” activity as each driver is adding pollution to the commons of the air while

enjoying the benefits of personal vehicle use. This can also be seen as a “taking out” behavior as the vehicle is using resources such as fuel and rubber for tires.

The example of a public radio station also helps clarify that the two ways in which an individual can act in self interest, “putting in” or “taking out”, can be both positive and negative for the commons. Looking at “putting in” behaviors, an individual may give money, as in the case of the public radio station, resulting in a positive influence on the commons and the individuals who listen to the station. Other “putting in” behavior such as throwing trash out the car window may have a negative impact on the commons and the individuals involved.

While commons dilemmas often vary in the extent they are giving or taking and positive or negative, they usually have at least three characteristics in common (Gifford, 2007). First, if one individual acts in self interest while the others act from public interest, the defector or self interested individual will earn a larger share of the commons or benefits. Second, if all individuals cooperate or act in public interest, all individuals will receive a higher benefit than if everyone defects. Finally, if everyone defects, the commons will be eventually destroyed. The story at the beginning of this introduction may help to clarify these three characteristics. If most individuals limit their harvest of yellow perch, then a defector will earn more benefits than the other group members. If everyone decides to cooperate for public good, everyone will receive more benefits in that the stability of the resource is ensured and, although limited, harvesting can be sustained for an extended period of time. This situation also meets the third criterion. If

everyone defects (behaving in a self-interested way), the yellow perch most likely will not be around for long.

Much of the work done on commons dilemmas was stimulated by the classic article “The Tragedy of the Commons” by Garrett Hardin (Hardin, 1986). According to Hardin, there are two possible outcomes for a resource in a commons dilemma: the destruction of the resource brought on by individuals acting in self interest or cooperation of all individuals leading to preservation of the commons. Hardin further asserted that this process of cooperation should entail mutually agreed upon coercion. In other words, the “coercion” of social pressure will lead participants to get along and work together or suffer the consequences together. If individuals choose to not be mutually coerced, for example, by not following agreed upon laws of a culture, the commons is headed for ruin.

Dawes later expanded Hardin’s ideas and coined the term social dilemma to refer to a larger group of logical dilemmas that include the commons dilemma, social traps, public goods dilemmas, and the prisoner’s dilemma (Dawes, 1980). A social dilemma was seen by Dawes as having two specific defining criteria. First, if individuals act in self interest or defect, they will receive more benefits or receive less severe loss than if they act in favor of the public good. Second, individuals in a group will all benefit more if they choose to cooperate. Note that these appear similar to the first two defining criteria of a commons dilemma. The term social dilemma was intended to include all types of dilemmas and emphasizes the social dimension of the individuals in the dilemmas while commons dilemma emphasizes specifically the resource dimension of the dilemma. For example, the dilemma of harvesting fish may be labeled a social dilemma, highlighting

the impact on the individual fishers or may be labeled a commons dilemma accenting the impact on the fish and the ecology of the lake.

Currently, there are multiple schools of thought that attempt to explain behavior in commons dilemma situations (Gifford, 2007). Limited processing theory is one theory that attempts to explain behavior in and offers solutions to commons dilemmas under the assertion that individuals do not always behave rationally (Dawes, 1980). Two forms of irrational behavior exist in this context for Dawes. First, individuals are simply being inattentive to the consequences of their actions. For example, the driver of a vehicle might give no consideration to the consequences of gas consumption or pollution. Secondly, individuals may act irrationally even with proper understanding of the decisions they are making and an effort to consider the consequences of their behavior. This is considered defection with conscious decision. It can result when the system is too complex for the individual to comprehend or when no one has explained the consequences of a particular individual's behavior or choice.

Another school of thought, structural/goal expectation theory, hypothesizes that a certain set of conditions is required for cooperation to occur within a social dilemma (Yamagishi, 1986). First, the individuals in the dilemma must agree that mutual cooperation is desirable. This often results when all individuals in the dilemma are engaged in interdependent behavior. Second, individuals in the dilemma must come to the conclusion that voluntary, individual behavior based on self-interest will not work to the individual's benefit in the long run. Last, all individuals in the dilemma must agree that structural changes are necessary to ensure cooperation by all.

An example of a structural change would be the election of an official in control of behavior within the community. For such a change to be effective, individuals must believe the change will work. From a structural/goal expectation theory perspective, if cooperation is to occur, it is required that all individuals in the dilemma change their beliefs from that of private interests to that of a belief in a common solution and support of the public. In Hardin's (1986) words, the individuals must "mutually agree to mutual coercion." Individuals must also be confident that their leaders are capable of solving the dilemma (Samuelson, 1991).

A variety of factors can influence behavior within a commons dilemma such as the number of harvesters or the rate of regeneration (Gifford & Hine, 1997b) and participants' perceptions of how the commons dilemma was previously treated (conservative, sustainable or exploitive harvesting) such as in Porter, 2007. It is possible that the environmental condition of exposure to mortality (Kasser & Sheldon, 2000) and the individual characteristic of how much the people consider the future consequences of their behavior (Lindsay & Strathman, 1997) may impact behavioral decisions within a commons dilemma. These concepts will be covered next.

Terror Management Theory

Terror management theory offers possible insights into how individuals address commons decisions, especially under circumstances when the individuals may be contemplating mortality. Terror Management theory (TMT) (Greenberg, Solomon, & Pyszczynski, 1986) is derived primarily from the works of Ernst Becker (e.g., 1962,

1964). Becker's perspective has its roots in philosophical, psychological, anthropological, and sociological theory. It is a broad theory which aids in explaining a variety of human behaviors. For example the theory attempts to address why we feel self-esteem and where our construct of culture comes from.

Becker describes death as the fundamental problem facing the individual. Our rational capacities allow us to ponder our existence. This leads to an understanding that we will inevitably die. Humans, similar to other animals, have an instinct and desire to survive. The conflict between the knowledge that we will die and our instinct for survival could cause debilitating anxiety. Becker theorizes that culture and self-esteem develop in order to control death anxiety. Becker's theories are the underlying components for TMT.

From the TMT perspective, culture is defined as a symbolic perceptual construction shared by groups of people to serve the essentially defensive function of minimizing anxiety associated with the awareness of death (Solomon, Greenberg & Pyszczynski, 1991). The cultural worldview is seen as providing a basis for minimizing anxiety by instilling the world with order and stability. The cultural worldview can be defined as a set of beliefs about the nature of reality shared by groups of individuals that provide meaning, stability, and order and the promise of literal or symbolic immortality (Harmon-Jones et al. 1997). Self-esteem can be defined as a belief regarding how well an individual is achieving the standards and values prescribed by the worldview. Culture can be thought of as an extension of the individual in this context. Individuals often defend their worldview and self-esteem because it serves to provide protection from death anxiety via the means of insuring immortality, also known as worldview defense.

Worldview defense can be seen as the attempt of the individual to strengthen culture-based beliefs of prescribed behavior. By supporting our culture and the people we identify with, we ensure our immortality.

Both cultural worldview and self-esteem serve to protect the individual from death anxiety by granting literal and symbolic immortality (Harmon-Jones et al., 1997). Arising from self-esteem, symbolic immortality can be seen as the perceived continuation of the individual after death in the way she or he has influenced a culture that will live on after she or he is dead. This may or may not include physical evidence of the person's existence. Establishment of a nonprofit organization, contributions to arts and literature, and development of moral philosophies and laws are means of establishing symbolic immortality. Literal immortality, on the other hand, refers to immortality that is granted by moral/religious codes of the cultural worldview. For example, individuals may be granted eternal life if they meet the moral codes and standards of their culture. An example of this would be Christianity and the offer of eternal life in heaven. Thus, in attempts to maintain reassurance of both symbolic and literal immortality, TMT asserts that many individual and social behaviors are focused on preserving worldview and self-esteem (Pyszczynski, Greenberg, & Solomon, 1997). Specifically, self-esteem allows individuals to gauge their individual characteristics and achievements in contribution to their symbolic legacy and to gauge themselves against cultural worldviews of expectations for literal immortality.

Self-esteem consists of the perception that one is a valuable part of a meaningful universe and essentially functions to buffer death anxiety within the TMT context

(Solomon, Greenberg & Pyszczynski, 1991). Self-esteem is seen as the perception that one is meeting the requirements of value accepted by the cultural worldview and one thus has value as an individual and is granted symbolic immortality. Self-esteem then has two components: a meaningful conception of reality, and the perception that one is meeting the standards of value held within this view of reality. Individuals have self-esteem because they feel they are valuable contributors to society and that they live up to the socially expected norms of the culture. Culture and self-esteem are seen as culturally-contrived functions that provide protection from death anxiety via literal and symbolic immortality. Individuals have high self-esteem resulting from a comparison of the self to the worldview. The result is the individual feeling they are adequately meeting culturally prescribed values and contingencies for immortality, hence reassuring themselves of their immortality (Pyszczynski, Greenberg, & Solomon, 1997).

The self is defined in this context as a system of thoughts that regulates behavior (Pyszczynski, 2004). This set of highly complicated and developed abilities enables us to think and use abstract symbols (e.g. language), project ourselves into future times and situations that we have never experienced. These abilities allow us to reflect back on ourselves and foresee our inevitable death, the fundamental issue of human existence. Following from this, people are fundamentally motivated to maintain their individual existence. A high evaluation of oneself with respect to one's cultural worldview results in elevated self-esteem which in turn grants the individual immortality (in a symbolic sense).

Anxiety Buffer Hypothesis

Terror management theory has two main assertions. The first main assertion is known as the anxiety buffer function hypothesis. The anxiety buffer hypothesis states that increasing self-esteem or faith in one's cultural worldview makes the individual less prone to anxiety, anxiety-related behavior, and thoughts of death. Consequently self-esteem acts as an anxiety buffer by granting the possibility of immortality (Pyszczynski, 2004). The anxiety buffer function is composed of two parts: worldview defense and self-esteem booster. These two functions are attempts to control death-related anxiety; they function in a distinct manner while both offering forms of immortality.

Restated, the anxiety buffer hypothesis states that self-esteem and cultural worldview grant the possibility of immortality and hence act as a buffer against death anxiety. The anxiety buffer hypothesis has received both correlational and experimental support. Classic correlational evidence commonly offered in support of this function includes a consistent relationship between low self-esteem and anxiety (e.g., French, 1968; Rosenberg & Simmons, 1972) and a negative relationship between self-esteem and pessimistic views of the future (Coopersmith, 1967). With respect to TMT, an individual with lower self-esteem was likely to experience high anxiety because the proper function of anxiety buffering did not occur. The result of low self-esteem was the individual lost faith in personal immortality and was not as positive about the future.

Experimental evidence directly testing the anxiety buffer hypothesis includes Greenberg et al.'s (1992) who found that boosting self-esteem reduced the amount of reported anxiety in response to mortality salience. Further investigation revealed that

participants with dispositional and temporally elevated self-esteem did not exhibit efforts to deny vulnerability to death (Greenberg et al., 1993). Individuals with dispositional and temporally elevated self-esteem have also been demonstrated to not have increases in worldview defense and typically aroused death thought access (Harmon-Jones et al., 1997). To summarize, research supports the concept that individuals with both natural and temporally elevated levels of self-esteem are better able to buffer anxiety. This results in a decrease in the availability of death-related constructs due to a more effective buffering response resulting from the functioning of self-esteem and worldview.

Due to the fact that culture is the basis for self-esteem and worldview, the culture that the individual identifies with is instrumental in the anxiety buffering process. It was therefore hypothesized that a reminder of death to a specific culture would instigate support and defense of that particular culture (Janssen, Dechesne, & Van Kippenberg, 1999). In support of this hypothesis, reminders of mortality to youth caused them to greatly identify with and defend their youth culture. The individuals of a particular culture construct a worldview in order to instill meaning and provide an understanding of life and death. As was demonstrated by the youth in this research, individuals base their self-esteem and reassurance of immortality on the culture with which they identify.

Further substantiating the culture the individual identifies with is of importance, it has been found that youth culture only functions as an anxiety buffer in the context that youth have adequate social power to construct their own culture (Reiling, 2002). These implications were suggested as a result of a longitudinal study lasting a period of over ten years with in-depth interviews and observations of individuals within an Amish

settlement. As the Amish youth subculture was defined by adults, prescribed norms for youth culture actually intensified anxiety and depression within this sample. It appears that individuals must not only identify with their culture, but also actively define and accept the prescribed norms of behavior.

Recent work has also shown that challenges to worldview allow death-related thoughts to be more readily available after exposure to mortality salience (Friedman & Rholes, 2007). As hypothesized, self-identified fundamental Christians who encountered material that challenged the fundamental belief that the Bible was free of inconsistencies and contradictions were found to have higher accessibility to death-related cognitions after being exposed to thoughts of their own mortality. From a TMT perspective, the challenge to the fundamental beliefs of the individual weakened their support and commitment to their particular cultural identity. In this way, the individual was not properly able to buffer the anxiety caused by mortality salience. In particular, the individual's literal immortality was threatened and the individual was not as well suited to handle the anxiety imposed by immortality.

Mortality Salience Hypothesis

Many conclusions can be drawn from research on the anxiety buffer hypothesis. It is suggested that reminders of the inevitability of death lead to a range of attempts to maintain faith in worldview and self-esteem and the individual will defend threats to worldview and self-esteem as the individual's literal and symbolic immortality are dependent on them (Pyszczynski, 2004). This hypothesis is known as the mortality

salience hypothesis and can be plainly stated as reminders of death induce anxiety about death the person handles with self-esteem and culture.

An example of recent work in this area addressed the desire of people to have children under conditions of mortality salience (Fritsche et al., 2007). In this research, individuals in the mortality salience condition were asked to write the first sentence that came to mind when they thought about their own death. Individuals in the control condition were asked to respond to a question about dental pain. It was found that individuals in the mortality salience condition reported a desire for more children as compared to those in the control condition. These results may be interpreted as follows: an increase in the number of children one has may be related to both worldview and self-esteem and hence offer immortality to the individual. Interestingly, the number of children an individual is giving to society (along with the resources a new life will require) can also be interpreted as a commons dilemma where the private and public good are at odds with each other. The procedures described in this research also highlight how classic mortality salience research is conducted.

As in Landau & Greenberg (2006), participants were randomly assigned to a mortality salience condition and a control condition. In this particular example, participants in the mortality salience condition responded to an open-ended question about death. Specifically, individuals responded to the prompt “Please write down the first sentence that comes to mind when thinking about your own death.” Individuals in the control condition responded to a question that was similar in design and that controlled for aversion to an adverse experience. Participants were prompted by

responding to respond to a question about dental pain. On completion of this activity, participants next completed a filler task designed to place a time delay after the manipulation. In this particular example, participants completed a self report measure of mood to allow for a more effective manipulation. It allowed for a short time delay after the reminder of mortality, a procedure that was shown to be effective by Greenberg, Pyszczynski, Solomon, Simon, & Breus, (1994).

Following the administration of the filler task, the measure of specific research interest was generally given. At this point, Landau & Greenberg (2006) administered a measure of risky behavior. It was concluded from this research that mortality salience caused high self-esteem individuals to pursue high risk opportunities, but caused low self-esteem individuals to become more risk averse. From a TMT perspective, mortality salience increased the attempts of the individual to elevate self-esteem. Individuals with higher self-esteem were more likely to take risks under conditions of mortality salience to gain reassurance of their immortality than were low self-esteem individuals who were not capable of lowering their self-esteem any more as a result of failure. As the self-esteem was so important to the individual, lower self-esteem individuals worked to preserve what positive self-esteem they had left rather than risk failure. High self-esteem individuals however, were willing to take more risks as they could withstand a decrease in self-esteem resulting from failure.

Mortality Salience and Commons Dilemma

Research on mortality salience has also focused on individual behavior in commons dilemmas. Kasser and Sheldon (2000) found that individuals who experienced mortality salience were more likely to consume resources in a commons dilemma situation. Participants harvested 12 percent more trees in the mortality salience condition than in the control group in one round of a simulated harvesting game. The mortality salience condition entailed writing short responses to questions addressing physical and emotional experiences on considering one's own death. Those in the control condition were asked to respond to the same questions about listening to music. It was found that the conditions led to different financial expectations in 15 years and to differences in the number of trees harvested in a simulated, one-round commons dilemma. From a TMT perspective, individuals who experienced mortality salience manipulations were more likely to consume more resources in a harvest dilemma. By consuming and possessing more resources (defecting), the individuals may have increased their self-esteem thus reaffirming their assurance of symbolic immortality. Alternatively, having a higher social status of anticipated higher future income the individual may be able to elevate his or her self-esteem by meeting cultural expectations and further reaffirming his or her literal immortality.

This research indicates that thoughts of death compel an individual to consume more resources in a commons dilemma and leads him or her to anticipate more resources in the future. But, when confronted with our own death, we do not always behave defectively. Jonas, Schimel, Greenberg, & Pyszczynski (2002) found that mortality

salience increased the amount people were willing to give to an American charity, but not to a charity benefiting a foreign cause. Stated differently, individuals exposed to mortality salience were more cooperative in a commons dilemma when the cooperation only affected their own culture.

The mortality salience condition used to achieve these results was the experience of individual exposure to a funeral home. Participants in the mortality salience condition were approached within two blocks of passing a funeral home and participants in the control condition were approached at four blocks away. This was then replicated in a controlled setting with simulated donation activities and a mortality attitudes personality survey. These results were explained by TMT: by supporting a cause that the individuals felt would assist their culture, they reaffirmed not only the worth of their culture, but also their contribution to this culture. The consequence was to elevate self-esteem and offer the possibility of immortality. However, when the individual's culture was not directly impacted and there were no means of assuring that the contribution of the individual would be observed by his culture, the person would not act in a cooperative manner.

These two studies may seem contradictory at first glance, but they represented the only two studies known to the author that evaluated behavior in a commons dilemma under conditions of mortality salience. How was mortality salience increasing cooperative behavior in some commons dilemmas and increasing defective behavior in others? To start with, the difference in behavior could be related to the different types of common situations. Under conditions of mortality salience individuals acted more defectively in "taking out" commons dilemmas and more cooperatively in "putting in"

dilemmas. There was however a common element. In these situations the individual was able to elevate his or her self-esteem by means of relegation of resources. This relegation of resources may have applied to the individual's personal benefit or to the benefit of the person's culture. Both of these behaviors resulted in the individual reassuring his or her potential for immortality from the perspective of TMT and entailed consideration of the consequences of behavior.

Consideration of Future Consequences

The temporal dimension of dilemmas has recently received attention (e.g., Joireman, Van Lange, & Van Vugt, 2004; Kortenkamp & Moore, 2006). Individuals have been shown to limit resource consumption if the negative effects of their consumption behaviors occur earlier rather than later (Kortenkamp & Moore, 2006). This effect was demonstrated by using a hypothetical response question in which participants rated the percentage of how much they were willing to limit consumption in the simulated commons dilemma of harvesting fish and the dilemma of donating money to a local watershed protection program. As the certainty of negative consequences of behavior increased and the time for consequences shortened, individuals were more likely to cooperate within the dilemmas.

In the same study, donation behavior was found to be higher when the organization was framed as helping the current generation as opposed to helping the next generation. This indicated that people were more likely to take action if they believed that consequences would happen to them personally. The donation simulation used by

researchers allowed participants to exchange their participation credit for a donation to a charity on their behalf. The situation was set up so that the individual contributions were small, but if the whole group decided to donate, the total contributions would be considerable. This was achieved by having individual contribution amounts be small, but if all participants donated, a higher amount would be donated on their behalf than if even one individual did not cooperate. The timing of an action's consequences or benefits was an important element in the decision-making process. Individuals, who believed that certain consequences were more immediate, would more than likely respond to the situation with a cooperative decision.

These relationships were explainable from a TMT perspective. As the individual perceived more certainty of consequences happening either to him or the commons and if these consequences were likely to have an impact sooner, then the individual was more likely to behave in a way that benefited him or his culture. This attempt increased self-esteem and resulted in reassurance of either literal or symbolic immortality.

The individual difference measure consideration of future consequences (CFC) was created by Strathman, Gleicher, Boninger, & Edwards (1993). It measured the extent to which an individual considered distant versus immediate consequences of a potential behavior. The CFC scale was found to be a useful tool in predicting environmental behavior and attitudes (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001). Individuals scoring high on CFC expressed greater pro-environmental intentions, involvement, and behavior compared to low CFC scoring individuals. Further, high CFC individuals had stronger beliefs about the individual, cultural, and biosphere

consequences of current environmental circumstances. In this research, the relationship between CFC and environmental intentions and behavior was mediated by perceived consequences of action to the individual, culture and biosphere. In this way, high CFC individuals had a disproportionately positive relation between the perceived consequences of action and environmental intentions and behavior.

The measure of CFC was also found to be a useful tool in predicting behavior in “putting in” resource dilemmas such as recycling behavior (Lindsay & Strathman, 1997), and “taking out” resource dilemmas such as transportation preferences (Joireman, Van Lange, & Van Vugt, 2004). As scores of CFC increased, individuals were more likely to recycle as assessed by phone interview techniques, and commuters were more likely to use alternative means of transportation as assessed by survey. In these situations, higher scores on CFC predicted higher rates of cooperation and more pro-environmental behavior within commons dilemma situations.

Hypotheses

Previous research supported the assertion that mortality salience encouraged defective behavior in “taking out” commons dilemma situations and also supported the notion that mortality salience encouraged cooperative behavior within “putting in” commons dilemmas. Previous research also supported the theory that CFC was a useful tool in predicting both taking out and putting in commons dilemma situations. However, previous research has not attempted to investigate the taking out and giving behavior of individuals in a commons dilemma situation resulting from a single mortality salience

manipulation nor has research addressed the relationship between CFC and behavior in commons dilemma situations under the conditions of mortality salience.

Hypothesis 1: A reminder of mortality will lead to an increase in defective behavior within a “taking out” commons dilemma.

Hypothesis 2: Resulting from the same reminder, mortality salience will lead to an increase in cooperative behavior within a “putting in” commons dilemma situation.

Hypothesis 3: Scores on consideration of future consequences will predict the amount of cooperation within commons dilemmas with higher scores predicting higher cooperation in both a “taking out” and “putting in” commons dilemma.

PILOT STUDY

Method

Previous research at Humboldt State University has failed to achieve a successful mortality salience manipulation (Estepa, 2005; McVean, 2004). Two of these previous studies administered the projective life attitudes assessment as the mortality salience manipulation and suggested possible explanations for its ineffectiveness.

McVean (2004) administered the projective life attitudes assessment followed by a filler task relating to homelessness and used Templer's (1970) death anxiety scale as a manipulation check. It was suggested that the filler task may have acted as a mortality salience manipulation as it asked participants to describe their "interactions with and attitudes toward homeless persons." The length of the filler task was also questioned. Participants spent between 5 and 30 minutes completing the distraction task. It was also suggested that participants may not have paid proper attention to the material, in part because they were mostly freshman. In line with Estepa, Davis, Skuse, & Gold (2004) findings that freshman are less likely to follow instructions when completing a survey packet as compared to upperclassmen, McVean suggested that the ineffectiveness of the manipulation may have been from lack of attention or trying to complete the packet quickly.

McVean also suggested that the manipulation check used (death anxiety scale) may not have properly measured the desired construct. It was indicated that the death anxiety scale measured trait anxiety, and not state anxiety as is produced by mortality

salience. It was also suggested that the death anxiety scale measured conscious fear of death and not subconscious fears as produced by the manipulation. As the aim of the anxiety buffer was to keep subconscious anxiety of death from consciousness, a measure of the level of death constructs on a subconscious level was suggested.

Estepa (2005) made similar suggestions as to why the projective life attitudes assessment failed to be found successful in the sample population. Estepa also suggested that there may have been problems with the filler packet. In this case, it was concluded that the filler task may have been too short. Some participants completed the filler task as soon as one minute after the completion of the mortality salience manipulation. Therefore participants may not have given the manipulation enough attention for it to be effective. The suggestion was made to use a video in order to attempt to capture the participant's attention to insure a successful manipulation. These two studies indicated that the mortality salience manipulation, filler task and manipulation check were all important aspects to investigate prior to further research.

Participants. Participants consisted of Humboldt State University students and were recruited during class time in three classes. The accepted standards for care of human participants were followed and approval was received from the campus internal review board (approval #07-59) prior to data collection. The 42 participants (76% female; $n = 32$) in the pilot study volunteered for extra class credit. This initial investigation was done to verify that a mortality salience manipulation could be found effective at Humboldt State University and to pre-test other measures and items for readability.

Procedure. The data collection required approximately 20 minutes for completion. The pilot study contained four conditions. Three conditions were mortality salience conditions which consisted of a short response condition, long response condition and a movie condition. The fourth condition was the control. Participants were randomly assigned to conditions. Multiple mortality salience conditions were used to gauge the effectiveness of different manipulations in the sample population as similar manipulations had failed previously.

Participation began with the distribution of a consent form (see Appendix A). The consent form was read to all participants and they were asked to indicate whether they were 18 years-of-age or older, write their name, then sign and date the form before proceeding with the research. Participants next completed the CFC scale designed to measure the extent to which an individual considers distant versus immediate consequences of a potential behavior (see Appendix B). The 12 items on this scale were rated on a five-point scale ranging from one to five. An example item was “often I engage in a particular behavior in order to achieve outcomes that may not result for many years.” Scores were reverse coded as necessary and responses summed for the total score for each participant.

At this point, participants had varying activities depending upon condition. Participants in the long mortality salience condition were given the morality attitudes personality survey (Rosenblatt, 1989; see Appendix C). The two questions on this survey were responded to with a full paragraph response and were “What will happen to you physically when you die?” and “What emotion does thinking about your own death

evoked?” Participants in the short mortality salience condition were given an adapted version of this morality attitudes personality survey (see Appendix D). The only alteration was that participants were asked to respond to the two questions with a single sentence instead of a full paragraph.

Participants in the movie condition had two short activities. First they watched a brief (approximately three minute) news clip with video footage and commentary of a plane crash. It should be noted that no graphic violence was depicted in the news clip. After the short movie was shown, participants were given one item to respond to in an attempt to disguise the true intentions of the clip. Participants were asked if they would be more likely to view this channel again after viewing this news footage (see Appendix E). They had the option of responding yes, no, or no influence.

Participants in the control condition completed a survey similar to the morality attitudes personality survey: the test taking attitudes personality survey (see Appendix F). This survey was designed by the researcher to be similar in structure and length, but gives instructions for participants to conceptualize and respond to two questions about test anxiety. This control was selected as it was similar in format to the mortality attitudes personality survey and provided the possibility to evoke anxiety, but did not evoke death anxiety. This control allowed for clarification that the manipulation was not just raising anxiety levels, but specifically death anxiety.

Next, all participants were given a packet that included the following items and surveys in order. The revised New Environmental Paradigm scale was the first survey in the packet and acted as a filler task (Dunlap, Van Liere, Mertig, & Jones, 2000; see

Appendix G). This 15-question survey asked participants to rank items on a five-point scale. This measure was chosen as the filler task as it did not provide any mortality salience prompts and was estimated to take approximately three minutes for completion.

The next survey in the packet was a word completion task designed by the researcher that was used to assess the availability of death constructs (see Appendix H). Similar word completion tasks have been used in previous work as a manipulation check (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Of the 15 responses, six were solvable with either death-related or non-death-related words while the remainder could not be filled with death related words. An example completion that could be done both with death and non-death words is “DE_ _.” In this case, the completion can be DEAL or DEAD. The number of death words present in the completion task of each participant served as the variable used to check the effectiveness of the manipulation.

Next, participants responded to a simulated commons dilemma which involved the “taking out” of resources from the commons (see Appendix I) and comprised of one round of harvesting as done by Kasser and Sheldon, 2000. A short paragraph adapted from Kortenkamp and Moore (2006), asked participants to place themselves in the position of being a commercial fisherman on Lake Michigan. Participants were asked how much they would be willing to limit their catch as a result of rapidly declining fish population and the possibility of fishing being prohibited. The response to this question was treated as a measure of harvest or “taking out” behavior within a commons dilemma.

Participants also responded to a commons dilemma situation involving the putting in of resources from the commons (see Appendix J). In a short paragraph designed by the

researcher, participants were asked to place themselves in the position of being a resident in a small community. This activity was similar to the Kortenkamp and Moore (2006) survey discussed previously, but gave participants an opportunity to donate instead of measuring harvest behavior. In this community, a park known for its ancient redwood grove and also known as a community meeting place was in danger of being closed because of a dumping and littering problem. The accumulation of waste was threatening the Redwood trees and becoming a health hazard. Local community members had formed a volunteer effort to save the park and its endangered trees. Participants were asked how much they would be willing to donate to the effort in terms of dollars. The response to this question was treated as a measure of donation or putting in behavior in a commons dilemma.

Demographic information was collected on the last survey in the packet (see Appendix K). The short survey contained seven questions such as sex and age. After all participants in the group completed the packet, each was given a debriefing form which was read aloud to them (see Appendix L). This form contained contact information for the researcher and for campus psychological services. It also briefly discussed some of the concepts of the study such as CFC.

Results. No problems were discovered with readability nor were there any missing responses. The data were normally distributed and homogeneity of variance not violated with the exception of the donation variable. One outlier was identified in the control group. This extreme outlier of 500 dollars was decreased to 200 dollars as this was two

standard deviations above the mean. Analysis was run both with and without the point decreased with no change to interpretation (both analyses were non-significant). However, results are reported with the point modified to meet assumptions.

A one way ANOVA was used to determine if differences existed in the number of death words between conditions, $F(3, 38) = 8.36, p < .001, \eta^2 = .40$ (see Table 1). The control group was significantly different from the short mortality salience condition, long mortality salience condition, and movie mortality salience. No other significant differences were found between groups in number of death words. No main effect was found for condition and amount willing to limit harvest (two times the arcsine of the square root of percentage willing to limit harvest minus .01 transformed), $F(3,38) = 0.14, p = .94$, and no significant differences were found between groups (see Table 1). No main effect was found for condition and amount willing to donate (square root of variable plus one transformed), $F(3, 38) = 0.40, p = .75$, and no significant differences were found between groups (see Table 1).

Table 1

Means and Standard Deviations for Number of Death Words, Amount Limit Harvest, and Amount Donated by Condition for Pilot Study

Condition	Death words		Amount limit harvest		Amount donated	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Control (<i>n</i> = 12)	1.33	0.78	44.17	29.76	51.67	60.54
Short (<i>n</i> = 10)	*3.20	1.03	47.20	31.93	67.00	71.96
Long (<i>n</i> = 11)	*2.73	1.10	39.09	38.65	60.45	52.65
Movie (<i>n</i> = 9)	*3.00	1.00	45.22	28.77	62.78	29.91

Note. *Significantly different from the control group ($p < .05$).

Discussion

The primary reason for the pilot study was to insure that at least one effective mortality salience manipulation could be achieved in the sample population. All three forms of mortality salience were found to be equally effective in inducing thought of

mortality as measured by the availability of death related constructs in the word completion task. There were no significant differences between any of the mortality salience groups, but the long response group preformed the worst in terms of means and standard deviations. This suggests that the method of inducing mortality salience used in previous research at Humboldt State University was the least effective manipulation for the sample population.

While there were no significant differences between conditions in the amount willing to limit harvest or amount donated, the movie and short response condition preformed best in terms of hypothesized results. It was noted that the movie condition also had significantly lower standard deviations from the short response condition. This taken with the suggestion of Estepa (2005) to use media to capture the attention of participants to hopefully ensure proper attention to the manipulation lead to the decision to use the movie condition as the mortality salience manipulation in the study. The pilot study also suggests that the filler task of completing the new environmental paradigm scale was effective in that it did not bring mortality into awareness of the individual and took an effective amount of time for completion. It also suggests that the word completion task was an effective manipulation check.

MAIN STUDY

Method

Participants. Participants consisted of Humboldt State University students and were recruited from the online research pool and received course credit for their participation. The accepted standards for care of human participants were followed and approval was received from the campus internal review board (approval #07-59). After completion of the pilot study, 52 participants (60% female; $n = 31$) volunteered for research (online) for class credit.

Power analysis was conducted for both hypotheses using SPSS Syntax prior to any data collection. To examine the relationship between mortality salience condition and environmental behavior, $d = 0.5$, $\alpha = .05$, a sample size consisting of 64 participants per group was necessary to achieve power of .80. However, to examine the correlation between CFC and environmental behavior with a moderate correlation, $r = .3$ and alpha of .05, a sample size of 84 participants was required to achieve a power of .80

Data from the pilot study (at least control and movie condition) were originally intended to be compiled with data from continued data collection, but was not for several reasons. First, the majority of participants in the pilot study participated for extra credit and the majority of participants in the main study participated for class credit. Second, the participants in the pilot study were given class time for participation whereas the rest of the participants had to sign up online beforehand and come to a scheduled meeting.

Next, the participants in the pilot study consisted mostly of upper level and graduate level students whereas the sample population for the rest of the data collection consisted primarily of introductory psychology course students. No demographic information was collected to directly test this. Participant group sizes also varied greatly with the pilot study having approximately three times the number of participants per data collection time period.

Conditions were also compared between data collection times on the variables of interest: death words, amount that the harvest was limited, amount of money donated, and consideration for future consequences. While conditions were similar for the most part, the control condition in the pilot study demonstrated significantly less willingness to limit harvest than was the case in the control condition of the study, $t(36) = -3.89, p = .008, d = 1.36$. Participants in the movie group of the pilot study demonstrated more willingness to limit harvest than participants in the main study, $t(33) = 2.23, p = .033, d = 0.29$. Participants in the movie condition of the pilot study also demonstrated significantly higher scores on consideration for future consequences as compared to the main study movie condition, $t(33) = 3.77, p = .001, d = 0.22$. Data were not included from the pilot study for analysis for these and the above mentioned reasons.

As a result of data not being compiled, adequate sample size was not achieved to meet a priori power analysis. This was particularly true for analyses concerning consideration for future consequences. As the mortality salience condition was found to alter behavior in harvest and donation activities, analysis of consideration for future

consequences needed to account for the covariate of condition and hence even greater sample size was needed.

Procedure. As the movie condition was suggested as the most effective manipulation by the pilot study and previous research with the sample population, it was used as the mortality salience manipulation. The control condition from the pilot study was also used. Each group of participants was randomly assigned to a single condition so all participants in a given group experienced the same condition. Participant group size ranged from two to five in the study. The procedures and design developed in the pilot study were used with the exception of the number of conditions.

Results

Data screening and assumptions. All data were examined prior to the main analysis for normality and violation of assumptions. Z-scores were calculated and compared to set criteria to determine if outliers existed for each variable (Field, 2005). Z-scores were calculated by subtracting the mean from each point and dividing the result by the standard deviation of all scores. After this step, skew and kurtosis statistics were divided by their standard error to calculate a z statistic. The desired ratio of less than three was achieved for all variables and all variance ratios were less than ten to one with group size ratios of less than four to one (Tabachnick & Fidell, 2001).

A Cohen's d statistic was calculated as a measure of effect size for all t tests (Howell, 2004). This calculation was done by dividing the difference between the means of each group by the estimated standard deviation of either population (square root of the

pooled variances). Post hoc analyses were conducted using the Tukey honestly significant difference comparison.

Examination of plots of the predicted scores by their residuals revealed no obvious problems with homoscedasticity, normality, or linearity of the residuals in regression analyses. Multicollinearity was examined through investigation of condition index and variance portion values. As no analysis yielded a condition index greater than thirty with more than one variance proportion above .5 in one row, no problems were observed with multicollinearity. Multivariate outliers were also investigated by examination of Mahalanobis values compared to critical values of chi square ($p < .001$).

Several variables were transformed prior to the main analysis. As the amount willing to limit harvest variable was a percent, it was necessary to use the arcsine transformation on the variable. This transformation was done on the square root of the harvest variable minus one percent (to remove ones from data before arcsine). The transformed variable was then multiplied by two for easier interpretability.

The donation variable was also transformed. The square root of the variable plus one (to remove zeros from data) was used in all analysis to meet assumptions of normality. It should also be noted that there was one missing data point in the donation variable in the movie condition.

The variable of consideration for future consequences of behavior was also centered for analysis by subtracting the mean value from each score. It should be noted that four outliers (7.7 %) were found with absolute z-scores values between 1.96 and 2.58. While this slightly exceeds the expected 5 % of a normal distribution, the data

points were not altered. Assumptions of homogeneity and normality were met with unchanged points and the sample distribution's variance from a normal distribution was equivalent to one participant answering differently on one question of the CFC measure. All items were reverse coded as necessary and totaled creating a possible range of twelve to sixty ($M = 41.6$, $SD = 7.4$).

Mortality salience. An independent means t test was used to assesses differences in number of death word by condition, $t(50) = -5.89$, $p < .001$, $d = -1.24$ (see Table 2). The control group had a significantly lower number of death words than the mortality salience condition. The minimum and maximum scores were also of interest. The control condition had a minimum of zero death words and a maximum of four while the mortality salience condition had a minimum of one death word and maximum of five.

An independent means t test was used to assesses differences in the percentage amount willing to limit harvest by condition (two times the arcsine of the square root of percentage willing to limit harvest minus .01 transformed), $t(50) = 8.56$, $p < .001$, $d = 2.37$ (see Table 2). Participants in the control group limited their harvest of resources significantly more than did those in the mortality salience condition.

Table 2

Means and Standard Deviations for Number of Death Words, Amount Willingness to Limit Harvest, and Donation Amount by Condition

Condition	Death words		Amount limit harvest		Amount donated	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Control	1.62	1.06	79.08	22.49	29.69	32.29
Mortality Saliency	3.31*	1.01	24.73*	20.58	74.80*	49.57

Note. With the exception of mortality saliency, amount donated ($n = 25$), $n = 26$ for all groups. *Significantly different from the control group ($p < .001$).

An independent means t test was used to assess differences in amount of dollars donated by condition (square root of variable plus one transformed), $t(49) = -4.36$, $p < .001$, $d = -1.22$ (see Table 2). The control group donated significantly less money than did the mortality saliency condition (mean differences of \$45.11).

Consideration of future consequences. Multiple regression analysis was run to predict the amount of willingness to limit harvest from condition, scores on CFC, and the interaction of condition and CFC (see Table 3). Each variable was entered in an individual block in the order listed. Condition added significantly to the model.

Consideration of future consequences did not add significantly to the model. The interaction of condition and CFC also did not add significantly to the model.

Table 3

Summary of Hierarchical Regression Analysis for Variables Predicting Amount Willingness to Limit Harvest

Variable	$R^2 \Delta$	$F \Delta$	β
Condition	.59*	73.29*	-0.76*
Consideration for future consequences	.01	0.58	-0.24
$R_{model}^2 = .60, p < .001$			
Interaction	.01	1.44	0.21
$R_{model}^2 = .61, p < .001$			

Note. Variables listed in order of entry into hierarchical multiple regression, $N = 52$. β 's are from the final model. Consideration for future consequences was centered for this analysis and the amount willing to limit harvest variable transformed by two times the arcsine of the square root of percentage willing to limit harvest minus .01. * $p < .001$.

Multiple regression analysis was run to predict the amount donated from condition, scores on CFC, and the interaction of the condition and CFC (see Table 4). The variables were entered in individual blocks in the order listed. Condition added significantly to the model. Concern for future consequences significantly added to the

model. As scores on CFC went up, the amount of donations also increased. The interaction of condition and CFC did not add significantly to the model.

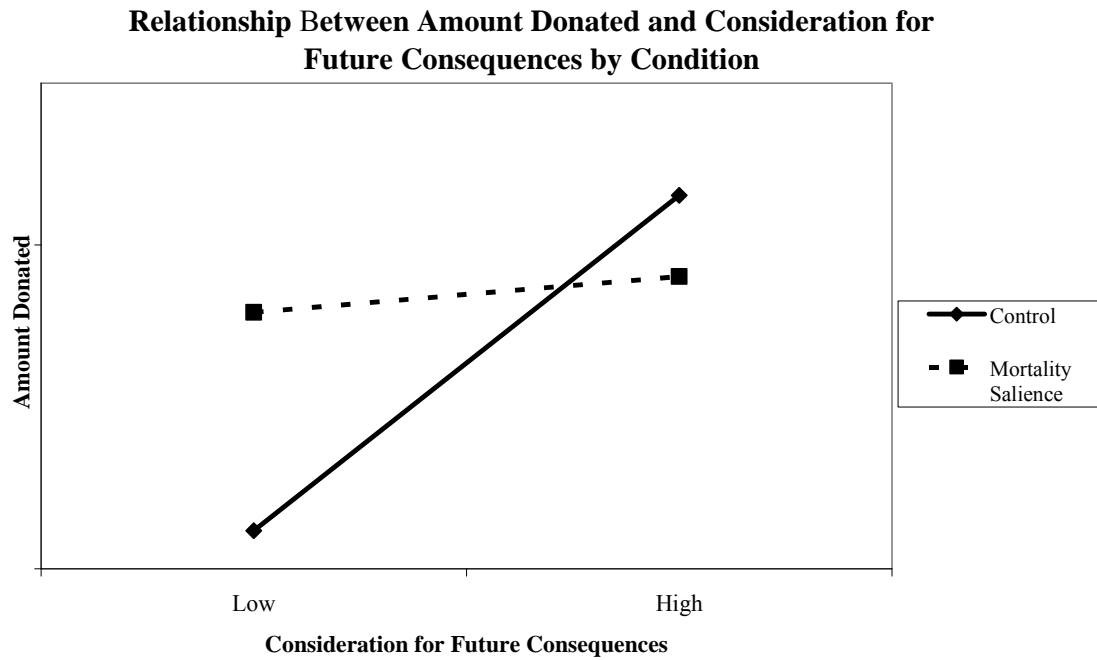
Since the interaction term was approaching significance ($p = .064$), the correlations between CFC and amount willing to limit harvest were investigated (see Figure 1). The control condition had a significant correlation between CFC and donations, $r(26) = .58, p < .01$. As scores went up on consideration for future consequences, participants were more likely to limit harvest. However, there was no significant relationship between CFC and donations for the mortality salience condition, $r(25) = .06, p = .78$.

Table 4

Summary of Hierarchical Regression Analysis for Variables Predicting Donation Amount

Variable	$R^2 \Delta$	$F \Delta$	β
Condition	.28***	18.97***	0.53***
Consideration for future consequences	.08*	6.27*	0.63**
$R \text{ model}^2 = .36, p < .001$			
Interaction	.05	3.56	-0.41
$R \text{ model}^2 = .41, p < .001$			

Note. Variables listed in order of entry into hierarchal multiple regression, $N = 51$. β 's are from the final model. Consideration for future consequences was centered for this analysis and the donation variable transformed with the square root of the variable plus one. * $p < .05$, ** $p < .01$, *** $p < .001$.



Note. Greater Consideration for future consequences is associated with higher donation amounts in the control condition but not under condition of mortality salience.

Figure 1. *Relationship between amount donated and consideration for future consequences by condition*

Discussion

Mortality salience. Prior to investigation of the hypotheses, the effectiveness of the mortality salience manipulation was checked. The mortality salience manipulation achieved the desired outcome of making death constructs more readily available to the individual as measured by the number of death words in a word completion task. In line

with previous research on mortality salience, brief exposure to material forcing an individual to contemplate mortality resulted in death-related constructs being more available to the individual. In opposition to previous work at Humboldt State (Estepa, 2005; McVean, 2004), these results further support the applicability of mortality salience research on this campus, specifically with the use of media as the manipulation, approximately a three minute filler task, and with a death word completion task as the manipulation check. This was the first time known to the author that a mortality salience manipulation has been found effective at Humboldt State University as gauged by either the manipulation check or the hypothesized results of a change to individual's behaviors.

It was first hypothesized that there would be a significant increase in defective behavior and secondly an increase in cooperative behavior in hypothetical commons dilemma situations as the result of a single manipulation. These hypotheses were supported. Following the mortality salience manipulation of watching a short news clip, individuals harvested more resources in a "taking out" commons dilemma and subsequently donated more money in a "putting in" commons dilemma. The effect sizes detected for both analyses were well above the standard for a large effect, specifically in the harvest behavior comparison. Participants in the control condition limited harvest by more than two standard deviations as compared to the mortality salience condition. The participants experiencing mortality salience also donated more than those experiencing the control (a one standard deviation difference).

Not only does this conclusion support previous research on both types of dilemmas, it indicates that these two processes are not in opposition to each other. A

single manipulation resulted in changes in both cooperative and defective behavior in different commons dilemma situations. This is the first time known to the author that one manipulation has been tested with multiple commons dilemma situations. This research also indicates that a single reminder of mortality can influence both “putting in” and “taking out” behaviors simultaneously.

This research suggests that a single reminder of mortality can increase defective behavior and then increase cooperative behavior within commons dilemma situations. In both situations, the individual may be seen as acting in self interest resulting in behavioral changes that affect the commons. By harvesting more, the individual is directly gaining more money or prestige, and by donating more the individual may increase his self-esteem by feeling perceived as charitable. If the individual is acting directly to accomplish the goal of increasing self-esteem to alleviate death anxiety, then the individual may be seen as acting out of self interest in both cooperative and defective behaviors under the condition of mortality salience.

A terror management perspective would suggest that watching the short news clip induced thoughts of ones own mortality resulting in individuals attempting to alleviate their death anxiety by bolstering self-esteem or by raising evaluation of themselves in a comparison to societal expectations. Note there was no measure of self-esteem in this experiment so interpretation is speculative. The increase in defective behavior can be seen as an attempt for individuals to boost their self-esteem directly or as a result of comparison of the self to worldview as a means of reassuring immortality. Likewise, the increase in cooperative behavior can be explained from a TMT perspective. The increase

in cooperative behavior could be viewed as an attempt by the participants to benefit their culture directly or as an attempt to increase self-esteem in that the individuals felt they were meeting the expectations of their worldview (were perceived as charitable). Both avenues reassure the participants of their immortality. The behavior changes in hypothetical commons dilemmas resulting from a reminder of mortality offers support for the applicability of TMT to commons dilemmas in that mortality salience may impact the individual's behavior and the commons as a whole.

Another interpretation of these results is that people tend to act in a more extreme manner when exposed to mortality provoking thoughts. The individual may be seen as taking more action or changing his behavior more drastically to alleviate their death anxiety as follows. In the harvest simulation, participants harvested significantly more fish compared to the control. In the donation simulation, participants in the mortality salience condition donated significantly more money. In both situations, the mortality salience condition took more action or had more extreme responses to the dilemmas. These results may be interpreted to indicate that mortality salience motivated individuals to action or motivated individuals to take more drastic action.

If the results of this study are generalized to everyday life, they may imply that subtle reminders of mortality (such as watching a brief news clip of a plane crash on the nightly news) may temporarily result in the individual increasing defective behavior in the commons dilemmas posed by everyday living. This information is valuable because it indicates that the removal of mortality cues from the mass media may result in a decrease in consumption behavior but at the cost of individuals being less willing to donate money

to local causes. If attempting to decrease consumption behavior, having constant reminders or threats of death may intensify the problem. On the other hand, if trying to motivate someone to give to a local cause, a subtle reminder of mortality may help assuming it is subtle and there is time for it to sink in. Further, the establishment of laws and regulations that limit individual exposure to mortality may result in behavioral changes in commons dilemmas

Consideration for future consequences. It was further hypothesized that scores on consideration of future consequences would predict the amount of cooperation within a “taking out” commons dilemma. In opposition to this hypothesis, levels of CFC did not predict the amount of harvest behavior (cooperation) within a hypothetical “taking out” resources dilemma. This was assessed after controlling for differences between the conditions caused by the manipulation. There also was not a significant interaction between condition and scores on CFC. This may be interpreted as indicating that there was no difference in the ability of CFC to predict harvest behavior between conditions; CFC was not an effective tool under either condition. These results do not support the position that CFC is a useful tool in predicting behavior in a “taking out” commons dilemma. However, it should be noted that a priori power analysis suggested a larger sample than was achieved to properly detect this possible relationship (see Participants for further discussion).

Offering evidence in support of the third hypothesis, levels of CFC predicted the amount individuals were willing to donate to a local cause (cooperate) within a hypothetical “putting in” commons dilemma after controlling for differences in donation

amount caused by the difference in reminder of mortality. The significance level of the interaction ($p = .065$) between condition and CFC indicated that the slopes of the two conditions were different. Further, there was a significant relationship between CFC and donations for the control condition but not for mortality salience. This suggests that within the control condition individuals disproportionately cooperated more as scores on CFC increased. From a TMT perspective, making individuals think about their death may equate to making the individuals not think about the future consequences of their actions. Replication is warranted for this important implication. These results suggest that the measure of CFC is a useful predictor of behavior in a “putting in” commons dilemma, specifically under conditions when mortality is not made salient and may be used to gain a better understanding of both TMT and behavior in commons dilemma situations.

Taken together, CFC was a useful tool in predicting “putting in” behavior in a commons dilemma, specifically under circumstances where mortality was not made salient, but was not useful in predicting “taking out” behavior in a commons dilemma under either condition. This study provides evidence that the measure of CFC may be a useful tool in predicting cooperative behavior in some resource dilemmas and under some circumstances. To further understand these circumstances, it is suggested that CFC literature could benefit from an examination of specifically what type of consequences people are evaluating. It is unclear if people are evaluating the consequences to themselves or to their culture or environment. It is also suggested that more attention should be directed toward the time length for considering consequences for various

behaviors. The measure of CFC appears to be measuring how much, not how long into the future individuals consider the impact of their behavior.

It is also suggested that the measure of CFC may not have been as applicable to the dilemma involving the harvesting of fish as to the dilemma involving the Redwood trees where a significant relationship was found. There is no mention of specifically how far into the future the measure of CFC is gauging consideration of consequences. It appears to be more a measure of how much, not of what length of time an individual considers the consequences of personal action. In the dilemma involving the harvesting of perch from Lake Michigan, consequences for defective behavior were expected to happen within the lifetime of the individual. In the Redwood tree example, consequences were expected to happen much sooner. It is suggested that CFC may not have been found to be effective because of the much longer delay in time for the consequences of behavior. While this measure may still be a useful tool in predicting behavior in both shorter and longer term consequence circumstances, it is suggested that even when controlling for amounts of CFC, time delay of consequences is still an important factor to consider.

Structural/goal expectation theory suggests certain conditions are necessary for cooperation to occur in a commons dilemma. These conditions could possibly include consideration for future consequences and exposure to mortality. As imagery of a commons in ruins (such as needles washing up on a beach) has been found to alter verbal and actual commitment to donations to a local pollution group (Hine & Gifford, 1991), it is suggested that depictions of ruin may induce thoughts of mortality in the individual and

hence lead to a change in individual behavior. Further, it is suggested that the change in individual behavior may have resulted from the individual not considering the future as a result of seeing a commons in ruins.

Restated, the depiction of the commons in ruins may have acted as a mortality salience manipulation and intensified individual behavior. The individual increased his personal perception of self-esteem and possibly reassured his sense of immortality alleviating the anxiety caused by exposure to the commons in ruins by taking action. In a situation such as this where people are being asked to donate time and money to conservation, this is of great benefit. Current research also suggests that people would simultaneously be more likely to consume more resources from other commons leading to greater destruction of the commons. This unfortunately would lead to the continued destruction of the commons and initiate a vicious transactional cycle cumulating in ruin of the commons. In conjunction with current research, it is suggested that exposure to mortality salience in the form of a news clip or possibly even viewing a commons in ruins may motivate individuals to consume more resources and simultaneously increase time and monetary commitment to restoration efforts.

LIMITATIONS AND FUTURE DIRECTIONS

Limitations have been noted in the current research and future research should attempt to address these shortcomings. To start with, research with actual as opposed to simulated commons dilemmas would be preferred. Second, the sample consisted of college students from a campus known for its pro-environmental attitudes. There was not a large difference in environmental beliefs between the current sample ($M = 3.69$ on a five point scale; ratio = .74) and previous work with a sample of Ohio university students ($M = 4.70$ on a seven point scale; ratio = .67) (Cordano, Welcomer, & Scherer, 2003). Still, this research should be repeated with different populations. It is also suggested that cross-cultural research should be used to check the generalizability of findings presented in this research as the concepts of TMT are culturally specific. Future research should also attempt to use either multiple giving and taking commons dilemma activities or use the practice of counterbalancing of commons dilemmas to ensure that the theorized relationship is not unidirectional.

It should be noted that the desired sample size of 84 participants was not reached for analyses incorporating CFC as discussed previously. As a result, power may not have been adequate to properly assess the relationship of CFC and commons dilemma behaviors. Further, the possible interaction of CFC and mortality salience should be investigated with a repeated measures design giving CFC before and after the mortality salience manipulation. Investigation of this difference may lead to an

understanding that mortality salience may equate to thinking only of short term consequences for the individual.

The current research also demonstrates many possible avenues for future study and has implications for how such research may be conducted. As this is the first time known to the author that a mortality salience manipulation has been found effective at Humboldt State University, it is suggested that many aspects of current research be utilized with this sample. Manipulations using media without graphic violence are suggested along with a manipulation check that measures subconscious death anxiety such as the word completion task used in current research. The recommendation to use media is also relevant to research on other campuses using primarily freshman as a sample population. It is also suggested that the filler task used between manipulation and manipulation check be approximately three minutes in length and not contain any mortality salience reminders such as the new environmental paradigm scale.

The importance of the theorized relationships and large effect sizes demonstrated in the current research are worthy of replication. As this is the first time that a mortality salience manipulation has been found affective at Humboldt State University and the first time that both “putting in” and “taking out” dilemmas have been investigated simultaneously under conditions of mortality salience, research at Humboldt State University and literature on commons dilemmas, TMT, and CFC would benefit from further investigation of current research hypotheses.

In regards to work with CFC, there is no mention of specifically how far into the future the measure is gauging consideration of consequences. It appears to be more a

measure of how much, not what length of time an individual considers the consequences of action. There also is no mention of whether the individual is gauging the consequences of behavior to herself or to the commons on the CFC measure. Future research should attempt to clarify these uncertainties.

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APPENDIX A
CONSENT TO ACT AS RESEARCH SUBJECT

CONSENT TO ACT AS RESEARCH SUBJECT

Christopher Reynolds, Student under the direction of Dr. David Campbell, Department
of Psychology, Humboldt State University

I hereby agree to have the following person carry out the following procedures on
me for experimental purposes: Christopher Reynolds

These procedures will take place in the Behavioral and Social Sciences building at
Humboldt State University. They will require approximately one half hour for
completion. I will be answering several surveys and writing short responses.
Demographic information will be collected at the end of the procedures. The purpose of
this study is to examine environmental behavior. I understand the procedures described to
me involve no foreseen risk to my wellbeing.

I understand that if I feel uncomfortable for any reason at any time during the
procedures, I can discontinue my participation without jeopardy. I understand that the
data obtained from me is confidential and my name will not be associated with the data
collected from me. I understand that Christopher Reynolds will answer any questions
concerning my participation. My participation in these procedures is completely
voluntary and I may withdraw at any time. I understand that the researcher may terminate
my participation at any time. Compensation for participation is course/extra credit and
possible entry into a drawing. I understand that if I choose not to participate in this study
I will not receive course/extra credit or possible drawing entry.

I am 18 years of age or older. Individuals under 18 may not participate.

Yes/No

Name:

Signature:

Date:

For any additional inquires, please contact Christopher Reynolds at
christophrareynolds@yahoo.com or Dr. David Campbell at dec1@humboldt.edu.

APPENDIX B
CONSIDERATION OF FUTURE CONSEQUENCES SCALE

Consideration of Future Consequences

For each of the items below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you) please write a “1” to the left of the question; if the statement is extremely characteristic of you (very much like you) please write a “5” next to the question. And, of course, use the numbers in the middle if you fall between the extremes. Please keep the following scale in mind as you rate each of the statements below.

1	2	3	4	5
Extremely Uncharacteristic	Somewhat Uncharacteristic	Uncertain	Somewhat Characteristic	Extremely Characteristic
_____	1. I consider how things might be in the future, and try to influence those things with my day to day behavior.			
_____	2. Often I engage in a particular behavior in order to achieve outcomes that may not result for many years.			
_____	3. I only act to satisfy immediate concerns, figuring the future will take care of itself.			
_____	4. My behavior is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.			
_____	5. My convenience is a big factor in the decisions I make or the actions I take.			
_____	6. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.			
_____	7. I think it is important to take warnings about negative outcomes seriously even if the negative outcomes will not occur for many years.			
_____	8. I think it is more important to perform a behavior with important distant consequences than a behavior with less-important immediate consequences.			
_____	9. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.			
_____	10. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.			
_____	11. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.			
_____	12. Since my day to day work has specific outcomes, it is more important to me than behavior that has distant outcomes.			

APPENDIX C
MORTALITY SALIENCE LONG RESPONSES CONDITION

Mortality Attitudes Personality Survey

The following questions have to do with a new form of projective personality assessment. The content of each of your paragraph responses will be analyzed. Please read the following questions about mortality and respond with a full paragraph response to each.

Please image your own death while responding with a paragraph to each of the following questions:

What will happen to you as you physically die?

What emotions does thinking about your own death evoke?

APPENDIX D
MORTALITY SALIENCE SHORT RESPONSES CONDITION

Mortality Attitudes Personality Survey

The following questions have to do with a new form of projective personality assessment. The content of each of your brief responses will be analyzed. Please read the following questions about mortality and respond with the first thought that comes to mind.

Please image your own death while responding to each of the following questions:

What will happen to you as you physically die?

What emotions does thinking about your own death evoke?

APPENDIX E
MORTALITY SALIENCE MOVIE CONDITION

News Clip Response

Please choose the response that best describes you when answering the following question.

Would you be more likely to watch this news channel again after viewing this footage?

- A. Yes, I would be more likely to watch this news channel in the future.
- B. No, I would be less likely to watch this news channel in the future.
- C. Viewing this clip did not influence my likelihood of watching this news channel.

APPENDIX F
MORTALITY SALIENCE CONTROL CONDITION

Test Taking Attitudes Personality Survey

The following questions have to do with a new form of projective personality assessment. The content of each of your paragraph responses will be analyzed. Please read the following questions about test taking and respond with a full paragraph response to each.

Please image you are preparing to begin taking a school examination while responding with a paragraph response to each of the following questions:

What happens to you physically when you are about to take a test?

What emotions are evoked when you are about to take a test?

APPENDIX G
NEW ECOLOGICAL PARADIGM SCALE

New Ecological Paradigm Scale

Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you STRONGLY AGREE, MILDLY AGREE, are UNSURE, MILDLY DISAGREE or STRONGLY DISAGREE with it.

STRONGLY MILDLY UNSURE MILDLY STRONGLY
AGREE AGREE DISAGREE DISAGREE

1. We are approaching the limit of the number of people the earth can support

2. Humans have the right to modify the natural environment to suit their needs

3. When humans interfere with nature it often produces disastrous consequences

4. Human ingenuity will insure that we do NOT make the earth unlivable

5. Humans are severely abusing the environment

6. The earth has plenty of natural resources if we just learn how to develop them

7. Plants and animals have as much right as humans to exist

8. The balance of nature is strong enough to cope with the impacts of modern industrial nations

9. Despite our special abilities humans are still subject to the laws of nature

10. The so-called “ecological crisis” facing humankind has been greatly exaggerated

11. The earth is liked a spaceship with very limited room and resources

12. Humans were meant to rule over the rest of nature

13. The balance of nature is very delicate and easily upset

14. Humans will eventually learn enough about how nature works to be able to control it

15. If things continue on their present course, we will soon experience a major ecological catastrophe

APPENDIX H
WORD COMPLETION TASK

Word Completion Task

Please complete the following words by filling in the missing letter. Only use letters that fit into the allotted number of spaces. An example question is R ____. This completion may be filled in with R E D or R U N for example. Please complete all 15 word completions.

1. R I ____
2. C O F F ____
3. B L ____
4. O V ____
5. G R A ____
6. T R ____
7. D E ____
8. W A L ____
9. S K ____
10. B ____
11. A ____
12. C O _____
13. L I F ____
14. S T ____
15. L __ V E

APPENDIX I
PARAGRAPH COMMONS DILEMMA SIMULATION, HARVEST ACTIVITY

Yellow Perch in Lake Michigan

Please imagine yourself in the following situation as if it was happening to you. You make your living by commercially fishing yellow perch on Lake Michigan. Lately, it has been harder and harder to make ends meet in the fishing industry because of falling prices for fish and declining fish populations, although you currently are making a decent living. The state Department of Natural Resources (DNR) reports that the current rate of fishing yellow perch is not sustainable. If changes are not made to limit individual's catches, the perch population will no longer be able to support commercial fishing and the DNR will be forced to prohibit all fishing of yellow perch.

Please respond to the following question as if you were in this situation:

1. How much would you be willing to limit your catch of yellow perch (in terms of %) if the DNR predicted the forced prohibition of all fishing was likely to occur during your lifetime?

_____ %

APPENDIX J
PARAGRAPH COMMONS DILEMMA SIMULATION, DONATION ACTIVITY

Local Conservation Effort

Please imagine yourself in the following situation as if it was happening to you. You live in a small residential community with a large park located in the center of the neighborhood. The park is well known for a large Redwood grove it contains and as a community gathering place for the neighborhood. Unfortunately, in recent years, the park has become littered with trash and a popular dumping site for old couches and tires. City officials are threatening to permanently close the park as the trash problem is threatening the safety of the Redwood grove and becoming a hazard for community health. Members of your community have formed a volunteer clean up effort that will clean the park and take measures to prevent further dumping. The community effort hopes to save the ancient Redwood grove and preserve the communal gathering place. However, the community volunteers are in desperate need of money for supplies for the restoration effort.

Please respond to the following question as if you lived in this neighborhood:

1. How much money would you be willing to donate to the community effort to save the Redwood grove and restore the communal meeting place?

_____ \$

APPENDIX K
DEMOGRAPHIC INFORMATION

Demographic Information

Please remember that all information will be held strictly confidential and your name will not be associated with your responses.

1. What is your age?

2. What is your sex?
Male/Female

3. What is your personal annual income?
A. Under \$20,000 a year
B. \$20,000-\$40,000 a year
C. \$40,000-\$60,000 a year
D. Over \$60,000 a year

4. What is your race?

5. What, if any, is your political affiliation?

6. Are you a self-claimed environmental activist?
Yes/No

7. Are you a psychology student at Humboldt State University?
Yes/No

APPENDIX L DEBRIEFING FORM

Debriefing

This research is part of an ongoing thesis being conducted by Christopher Reynolds, under the supervision of Dr. David Campbell. The purpose of the current research is to investigate how certain personal differences influence behavior. Specifically, the current research is focused on the personal characteristic of consideration of future consequences of behavior on environmental behavior. Due to the specific nature of the experiment, hypothesis can not be revealed at this time. Certain aspects of the research have been intentionally withheld from you for accuracy of data collection. For this deception the experimenters apologize. Results of this experiment and further clarification may be obtained on completion of data collection in May 2009.

Contact Information

If you wish to gain more information about this study, please contact Christopher Reynolds at christopherareynolds@yahoo.com or Dr. David Campbell at dec1@humboldt.edu.

Psychological Services

If this study evoked any painful thoughts or emotional responses that are troubling you, please contact the Student Health Center's Psychological Services at (707) 826-3236. The staff will be more than willing to provide you with assistance.