Terrified Killers: The Provocation of Feelings of Vulnerability to Death through a Bug Extermination Task.

A thesis submitted in partial fulfilment of the requirements for the degree of Master of Arts in Psychology at the University of Canterbury

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The theoretical perspective of Robert Lifton suggests that killing may provoke feelings of fear and vulnerability to death which may act as an impetus towards further killing. Through the use of a bug extermination paradigm two studies were conducted to test this theory. The first study tested the hypothesis that killing would provoke within the participant feelings of fear and vulnerability to death. The results found no support for a direct relationship between killing and provocation of feelings of fear or vulnerability to death. The second study sought to establish if the relationship between the perpetrator of an act of killing and their victim moderated the effects of killing on that perpetrator. Results found that the level of perceived similarity of the participants to the bugs was an important moderating variable with killing provoking feelings of vulnerability to death only in those participants who had high ratings of perceived similarity to the bugs. The results indicate the importance of the relationship between the perpetrator and the victim when an act of killing occurs. The results are then discussed in light of their importance and application to the current research literature.

Abstract

The theoretical perspective of Robert Lifton suggests that killing may provoke feelings of fear and vulnerability to death which may act as an impetus towards further killing. Through the use of a bug extermination paradigm two studies were conducted to test this theory. The first study tested the hypothesis that killing would provoke within the participant feelings of fear and vulnerability to death. The results found no support for a direct relationship between killing and provocation of feelings of fear or vulnerability to death. The second study sought to establish if the relationship between the perpetrator of an act of killing and their victim moderated the effects of killing on that perpetrator. Results found that the level of perceived similarity of the participants to the bugs was an important moderating variable with killing provoking feelings of vulnerability to death only in those participants who had high ratings of perceived similarity to the bugs. The results indicate the importance of the relationship between the perpetrator and the victim when an act of killing occurs. The results are then discussed in light of their importance and application to the current research literature.
Chapter 1: Introduction

1.1 Lifton’s theory on the relationship between killing and fear of death

The act of killing is perhaps one of the most destructive acts a person could ever commit. To end another’s life, to decide that a living being should cease to exist is a momentous act and one heavy with psychological implications for the perpetrator of that act (as well as, of course, for the victim). Although psychological responses to killing are by no means uniform, research has suggested that the act of killing can be an extremely unpleasant one and one which it appears most people seek to avoid (Grossman, 2001; White, 1998; MacNair; 2002). This study seeks to examine whether the act of killing provokes a particular profound response in the perpetrator—whether killing provokes fear of death within the person who commits the act of killing. If this is the case, it may have implications for various phenomena, such as for post traumatic stress disorder and instances in which killing appears to fuel itself, triggering further killing.

This research hypothesis draws chiefly on the theorising of Robert J. Lifton, who examined the processes involved in killing in his research on the Nazi Holocaust (1986) and the Vietnam War (1974). Lifton’s research into the Nazi Holocaust provided compelling ideas as to some of the potential psychological constructs involved when a human commits an act of killing. Lifton was particularly interested in understanding the psychological processes motivating the Nazi doctors who were employed in the concentration camps and involved in operation of the gas chambers
that lead to the death of so many of the Jewish people during World War 2. A key question for Lifton was how the Nazi doctors managed to reconcile their acts in the concentration camps with their Hippocratic Oath as doctors to always preserve life. Essentially, Lifton wanted to understand how a life giver could so quickly become a life taker. This is an interesting question to understand as if ordinary doctors could be compelled to act in this way then it has clear implications for how a wide range of people could possibly react when faced with similar circumstances. Through his research, Lifton created an extensive theory exploring the power of death to motivate people towards committing acts of genocide.

One of the things Lifton noted in his research was the reports of strong feelings of fear of death by those who worked in the concentration camps. Lifton (1986) recorded observations that the all-powerful figures in the concentration camps seemed fearful, “They were terribly afraid of death [as Tadeusz S. observed]. The greatest murderers were the greatest cowards” (p. 448). An important part of Lifton’s research into the Holocaust centred on a dichotomy between power and fear.

Lifton conducted a number of interviews with the doctors involved in the Jewish concentration camps. The information from these interviews revealed some insights into what was happening psychologically for the doctors when they were involved in killing. Lifton (1986) recorded that when the doctors were involved with the operation of the gas chambers in the concentration camps they were in a psychological state that:

…responded to encouragement for strong feelings of omnipotence and expressed them as required in relatively structured Auschwitz form; that expression in turn created actual or potential anxiety having to do with death and killing, which then required additional feelings of omnipotence-sadism in order to ward off that anxiety. (Lifton, 1986, p. 449)
Lifton is suggesting that the perpetrators of acts of killing are undergoing great anxiety having to do with death and killing when they commit these acts, which requires further killing to ward off this anxiety. In a sense a cyclical relationship between killing and fear of death is hypothesised, where killing creates a psychological state which is unpleasant and anxiety provoking but can be alleviated by the feelings of power and omnipotence received from further acts of killing.

Why might killing raise anxiety about an individual’s own death? Lifton suggests that the act of killing itself serves as a double edged sword, by both raising an individual’s fear of death and at the same time giving them a feeling of omnipotence to deal with that fear. Lifton proposes that:

There can readily follow a vicious circle in which one kills, needs to go on killing to maintain one’s cure, and seeks a process of murderous, deathless, therapeutic survival. One can then reach the state of perpetual survival through the killing of others in order to re-experience endlessly what Elias Canetti has called ‘the moment of power’- that is the moment of cure (Lifton, 1986, p.499)

The ‘cure’ that Lifton is referring to is a sense of relief from the death imagery that Lifton suggests one is constantly experiencing within situations where genocide occurs. Lifton suggested that Nazi society was full of death imagery, from the history of defeat and destruction in WW1, to a focus on death in local art, to the creation of an ancestor cult where the dead were more important than the living (Lifton, 1986, p.476). Lifton notes that this environment is not confined to the Nazi experience and that in the right circumstances anyone could follow this path (Lifton, 1986).

Expanding on this idea, it seems that the actual or potential anxiety created by killing that Lifton is referring to may occur as the act of killing serves a very real
reminder to the perpetrator of their own vulnerability to death. The Nazi doctors were involved in killing other human beings and despite the psychological mechanisms developed to cope with this it is unlikely that the doctors were able to completely remove themselves from the situation. If this is the case then committing an act of killing another human would act as a poignant reminder to the perpetrator that they are also only human and that their own life could be just as easily extinguished. The initial act of killing would then serve to remind to the perpetrator of the environment of death and destruction the perpetrator finds themselves in. This could have the effect of stripping away the walls and barriers the perpetrator has put in place to deny their own mortality and in doing so bring a debilitating fear of death rushing to the surface. Faced with such a reminder it becomes easier to see how the act of killing could raise within the perpetrator feelings of fear and vulnerability to death.

1.2 Fear and Genocide

Fear is an emotion that appears to be consistently reported by perpetrators across many very different circumstances where acts of genocide have occurred. Some researchers have gone as to far to say that fear is ‘essential’ to understanding genocide (Chirot & McCauley, 2006). This fear can be classified into two areas. Firstly, fear of pollution or contamination. This fear relates to a concern that one’s group will lose its distinction or importance through amalgamation with another group. Such examples can be seen in Hitler’s obsession with the ‘Jewish disease’ (Friedlander, 1997) and the rhetoric used by Serbians for the ethnic cleansing of Bosnia (Weitz, 2003). The second, more common fear is fear of destruction; that one’s group, culture and history will not survive. This fear can be seen in a number
of instances of genocide, be it the Turkish population facing the perceived extinction of their civilisation in 1915 (Akcam, 2006) or the Hutu population feeling threatened by the preferential treatment of the Tutsi population by the French in Rwanda in 1994 (Taylor, 1999). A common theme leading up to acts of genocide is the provocation of fear in the perpetrating group.

1.3 Killing provoking feelings of vulnerability to death

The idea that killing can provoke specifically feelings of fear and vulnerability to death may have support from the literature looking at soldiers who suffer from post traumatic stress disorder (PTSD). Research on the causes of PTSD has shown that killing another human is an event that can cause PTSD to occur. Studies on Vietnam veterans have shown a consistent association between higher levels of combat violence and participation in atrocities with increased levels of PTSD (Breslau & Davis, 1987; Green, Grace, Lindy, & Gleser, 1990; Yehuda, Southwick, & Giller, 1992). Studies looking at the effect of killing itself in a combat experience have shown that soldiers who kill have higher levels of PTSD (MacNair, 2002) and higher incidences of post combat interpersonal violence (Hiley-Young, Blake, Abueg, Rozynko, & Gusman, 1995) than soldiers who do not kill.

Further research into PTSD has suggested the important role of peritraumatic dissociation. Peritraumatic dissociation is where a person experiences feelings of being removed from a situation immediately following a traumatic event (Dell & O'Neill, 2009). This type of dissociation is considered by some researchers to be a predictor of PTSD (Marmar, Weiss, & Metzler, 1997). It has been suggested that the traumatic event causes an individual to feel fear and vulnerability for their own death
and this is what motivates an individual to dissociate immediately after a traumatic event (Kosloff et al., 2006). A study by Gershuny, Cloitre and Otto (2003) found that the relationship between peritraumatic dissociation and PTSD was mediated by fear of death and when fear of death was entered first in the regression analysis the association between peritraumatic dissociation and PTSD was completely eliminated, suggesting fear of death helps account for the effect of peritraumatic dissociation on the development PTSD. This result suggests that fear of death may play an important role in an individual experiencing peritraumatic dissociation and subsequently going on to develop PTSD.

In addition, perhaps consistent with the idea that identification with the victim serves an important part in leading people to feel more vulnerable to death after killing there is some evidence that seeing oneself in a victim can exacerbate PTSD. Reports suggest that PTSD rates were much higher for the American soldiers in Vietnam who found items on the soldiers they had killed (e.g. a wallet, photos etc.) that allowed them to identify with the victim (Lifton, 1974). It is possible his reminder prevented the perpetrator from denying their own mortality and may bring concerns of vulnerability to death to the surface.

The previously cited research clearly suggests that the act of killing is an event that can trigger PTSD. The research has also gone on to suggest that feelings of vulnerability to death are at least sometimes tied to PTSD. Thus, there is some empirical support for the theorising that the perpetration of killing could lead people to feel more vulnerable to death themselves. However, the idea that killing itself can arouse feelings of fear and vulnerability to death has not been directly tested.
One limitation of research into the effects of killing is that, due to obvious practical and ethical concerns, there is considerable difficulty in empirically testing theories about the impact killing has on an individual. As a result of this, the majority of outcome research into the effects of killing are retrospective focusing on observational studies and accounts of both the perpetrators and victims of atrocities (Beckham, Moore, & Reynolds, 2000). However, recent innovations in the empirical testing of the effect of killing have provided researchers with a paradigm that may allow the effective empirical testing of the psychological effects of killing to occur.

1.4 The ‘Bug Killing Paradigm’

Recent experimental innovations have given some interesting means of providing ethical empirical research into killing behaviour. A recent study (Martens, Kosloff, Greenberg, Landau. & Schmader, 2007) devised a bug-killing paradigm to evaluate the effects of psychological factors on the killing process. The study was based on a body of research that suggested the initial act of killing provides its own fuel for subsequent killing (as cited in Martens et al, 2007).

The research looked at induced bug-killing during a practice extermination task and whether this led to increased subsequent killing during the self paced extermination task in which participants had control over the number of bugs they exterminated. The rationale for the study was that the act of killing may ‘fuel’ subsequent killing as part of the perpetrator’s psychological attempts to both justify committing such an act and ease the psychological threat of prior killing (Martens et al, 2007). Participants were invited into a laboratory and after filling out some initial questionnaires were asked to carry out a practice extermination task where they were
asked to put either one bug (in the ‘initial killing’ condition) or no bugs (in the ‘no initial killing’ condition) into a ‘bug grinder’, an apparatus that appeared to kill the bugs. The device was designed in such a way that no bugs were actually harmed during the extermination task and this was later revealed to each participant. Following this, the participant was asked to carry out a self paced extermination task where they could choose the number of bugs put in the grinder.

The study found that those participants who put a bug into the grinder during the practice extermination task were more likely to put more bugs into the grinder in the following self paced bug extermination task. The researchers found a similar result when both conditions involved initial killing in the practice extermination task, finding that participants who put five bugs into the grinder during the practice extermination task were more likely to put a greater number of bugs into the grinder during the self paced extermination task than participants who put only one bug into the grinder during the practice extermination task. This provided support for the study’s key hypothesis that a higher rate of initial killing leads to higher rates of subsequent killing, or that ‘killing begets killing’ (Martens et al, 2007).

Interestingly, this study also tested the effect of the relationship between ratings of perceived similarity of the participant to the bugs they killed in the extermination task. The researchers suggested that a higher level of perceived similarity may affect the degree to which the participant was able to relate to the bugs. Participants with higher levels of perceived similarity to the bugs may have been more affected by killing the bugs as they saw something of themselves in the bugs making killing them a much more difficult act. Initially, perceived similarity to the victim should make a perpetrator more reluctant to kill. However, once an act of
killing has occurred the more similar the victim to the perpetrator the greater the psychological threat should be (Martens et al, 2007). If killing is fuelled by attempts to mitigate psychological threat then increased perceived similarity to the victim may fuel the effects of initial killing on subsequent killing. The researchers found that this was the case, with killing fuelling subsequent killing only in those participants with ratings of high perceived similarity to the bugs (Martens et al, 2007). A follow up study determined that the effect of killing fuelling subsequent killing was not due to practice effects (Martens, Kosloff & Jackson, 2010). These results suggest that the relationship between perpetrator and victim is an important aspect to consider when studying an act of killing as the closeness of this relationship may go some way towards predicting the psychological outcomes involved with killing.

1.5 The Present Studies

Through adoption of the bug killing paradigm the present research sought to empirically test the relationship between killing and feeling fear and vulnerability to death through two studies. The first study tested the first part of Lifton’s theorising, whether killing provokes fear of death in individuals. This was tested by having two conditions complete a bug extermination task where participants were asked to put bugs into a ‘bug grinder’ similar to the one by Martens and others (2007). Approximately half the participants were made aware that they were not killing the bugs by being shown that the extermination machine does not actually kill the bugs (Know Not Killing Condition), whereas the other half of the participants completed the extermination task thinking they were killing the bugs (Think Killing Condition). Both conditions then received a post-killing questionnaire, following the extermination task, to ascertain levels of fear and vulnerability to death. If Lifton’s
theorising is supported then those who think they are killing the bugs should show higher levels of fear and vulnerability to death on completion of the practice extermination task than those who know they are not killing the bugs.

The second study will test the effect of a potential moderating variable on the relationship between killing and feeling fear and vulnerability to death. This study will also test the second part of Lifton’s theorising that increased feelings of vulnerability to death will lead to further killing by observing whether higher reported levels of vulnerability to death are associated with increased subsequent killing during the extermination task.
Chapter 2: Study 1

Method

2.1 Participants

This study used a student sample from the University of Canterbury, recruited through advertising on the University’s notice boards and through the website of the introductory psychology course of the Department of Psychology. Forty-nine participants were recruited for this study. Thirty participants were recruited through the advertisements placed around the University of Canterbury and were financially compensated for their participation with 10-dollar shopping vouchers. The remaining 19 participants were undergraduate introductory psychology students from the University of Canterbury who completed the study as a requirement for course credit.

Of the 49 participants recruited, two withdrew after reading the information sheet and being informed of the nature of the study, citing that they did not feel comfortable with conducting the bug extermination task required of them. A further two participants were later excluded from the final analysis as they either had participated in similar bug-killing experiments or reported significant prior understanding of the research being conducted in the present study. Therefore, a total
of 45 participants were included in the final analysis (9 male, 36 female). The age of these participants ranged from 18 to 52, with a mean age of 23.88.

2.2 Procedure

*Introducing the experiment and cover story*

The experiment was conducted with one participant per session. The session lasted around 20 minutes. When the participant arrived at the laboratory to take part in the study they were greeted by the experimenter who informed the participant that they would be “participating in an experiment designed to look at human-animal interactions”. Participants were then told that “for the purposes of this study we are looking at the role of exterminators who deal with bugs”. The experimenter informed the participant that the experiment would involve conducting a short “bug extermination task” and before and after this task the experimenter would be giving the participant questionnaires to establish their own thoughts and feelings about the experience. Following this, participants were given an information sheet to read over (see Appendix 1) and a consent form (see Appendix 2) to sign if they were willing to continue with the study. While the participants were reading over this, the experimenter went and set up the bug killing apparatus and the bugs. If the participant was willing to continue they were taken around to where the bug killing apparatus was located and the experiment continued. If the participant decided to withdraw at this point the experimenter ended their participation giving them a full debriefing as to the nature of the experiment and answered any questions that the participant had.
Condition assignment and explanation

The participants were shown the bugs that they were to be working with. The bugs were arranged on a tray next to the bug killing apparatus in five rows with five containers per row (See Figure 1). The bugs were all wood slaters. Participants were then given an opportunity to take a look at the bugs. Following this, the experimenter showed the participants the bug killing apparatus. This apparatus was a purpose built ‘grinder’ which consisted of a coffee grinder (with identifying features removed) with a tube leading into the grinding mechanism that participants fed bugs into. The tube itself was blocked off near the base so that no bugs were harmed during the task. The experimenter produced a cover story for the use of the bug killing apparatus saying “normally exterminators use poisonous sprays and chemicals when working with bugs, however these are not considered safe to work with in the Psychology Department so we are using this bug killing apparatus instead”.

Figure 1: Set up of the bug containers prior to the commencement of the bug extermination task
At this point approximately half the participants were given an additional piece of information by the experimenter. These participants were invited to take a closer look at the grinder. The experimenter removed the lid from the grinder and showed the participants that the tube leading into the grinder was blocked off at the base meaning none of the bugs were being killed (see Figure 2). It was explained to these participants that the aim of this study was to “simulate the experience of killing the bugs” so the actual extermination of the bugs was not necessary. In contrast to this, the rest of the participants were not given this piece of information and thus thought that they would be killing the bugs. This created an effective control and test condition with both conditions doing the exact same task with the single exception of the control condition knowing they were not killing the bugs and the test condition believing they were killing the bugs. Participants were randomly assigned to one of these two conditions.

**Figure 2: View of grinder with top removed to show tube leading into grinder is blocked off**
The Practice Task and Personality Questionnaire

Following this, the participant was instructed by the experimenter to demonstrate their understanding of the task by picking up a bug, dumping it into the bug killing apparatus and switching the apparatus on. Once the participant completed this they were taken by the experimenter to a cubicle and were given a questionnaire to assess their feelings of fear of death (see Appendix 3) followed by a questionnaire to assess feelings of vulnerability (see Appendix 4). The Multidimensional Fear of Death Questionnaire (Hoelter, 1979) sought to tap into a participant’s fear of death by explicitly measuring a participant’s ratings of fear of death. The Vulnerability Questionnaire was adapted from an optimistic bias scale (Weinstein, 1980) in order to ascertain a participant’s level of vulnerability by providing them with a series of questions asking them to evaluate their perception of the likelihood of positive and negative events happening to them. The experimenter provided the cover story that these questionnaires were used to “attempt to tap into some of the psychological processes that we have identified as important for bug exterminators”. Once the participant had finished these the experimenter collected the questionnaires and took the participant back to the bug killing apparatus where the experimenter began to give the participant instructions on the extermination task.
The Extermination Task

The participant was given the following instructions by the experimenter.

“Now I’ll give you a brief extermination experience. I’m going to ask you to put the bugs into the grinder, one at a time, for a 25-second period. That way everybody in the study has the same length extermination experience. Please do this task continuously over the 25-second period. Here’s a timer. When I close the door, you can hit the start button and put bugs into the grinder. When the 25 seconds is up the alarm will go off. At that point, press the stop button on the timer and turn on the grinder for at least three seconds. Do you have any questions about that? I’ll come back in once you’ve finished”. The experimenter then left the participant to complete the task returning when they heard the sound of the grinder being activated. Once the participant had completed this, the experimenter sat down with the participant and began the debriefing.

Suspicion Test and Debriefing

The experimenter began the debriefing by asking a series of probing questions in order to test the participant’s suspicions. Following this the participant received a detailed debriefing by the experimenter covering the reasons behind the research as well as key areas of the research design. The experimenter also gave the participant a re-consent form (see Appendix 5) after the debriefing for the participant to either allow their data to be used or to specify that it was to be destroyed (no participants disallowed the use of their data). The participant was then thanked for their time and
informed if they had any queries that arose later to contact the experimenter. Once the participants had left, the experimenter moved the bugs back to a cool, damp storage facility and prepared the laboratory for the next participant.

2.3 Materials

The Bug Killing Apparatus and the Bugs

The bug killing apparatus has been designed and successfully used in earlier studies of the effects of killing on participants (Martens et al, 2007; Martens et al, 2010). The device comprised of a plastic coffee grinder which had a long plastic tub affixed which fed down into the grinding mechanism (see Figure 3). The tube was curved at its base so that the length of it extended 12cms above the grinder, giving the appearance of a chute leading directly into the grinding section of the grinder. At the tip of the tube was set a plastic funnel with a closed-off plastic tube attached. This sat inside the chute with the plastic funnel at the top. At the base of the tube an unseen plastic plug was inserted to prevent bugs from falling through into the grinding mechanism. This plastic plug combined with the closed-off tube attached to the funnel prevented any of the bugs placed into the grinder from ever being ground up. The bug killing apparatus was fitted with a switch that when pressed down activated the grinding mechanism and caused the blades of the grinder to spin causing the sound and feel of the grinder operating.
Figure 3: The bug killing apparatus

The bugs used in this study are known as slaters (also known as wood lice/pill bugs) a scavenger species of *isopoda*. Slaters were selected as an appropriate bug for this experiment based on similar studies employing these insects (Martens et al, 2007; Martens et al, 2010). The slaters were kept in a cool, damp environment with wood and soil being routinely changed. The slaters were fed on grated carrot and potato and acclimatised well to their artificial habitat. Throughout the daily experiment process the slaters were rotated to ensure that the same slaters were not used in every single trial for that day.

*Mortality Salience and Vulnerability Measures*

In order to measure fear of death, the Multidimensional Fear of Death Scale (Hoelter, 1979) was selected. This 42 item questionnaire identifies eight different factors involved in fear of death. These factors are, fear of the dying process, fear of the dead, fear of being destroyed, fear for significant others, fear of the unknown, fear
of conscious death, fear for the body after death and fear of premature death. Follow up research suggest that this measure has a strong level of reliability and validity (Walkey, 1982). The scale was modified in this study to present a shortened version containing 29 items designed to measure five of the eight original factors involved in fear of death (fear of the dying process, fear of the dead, fear of the unknown, fear of a conscious death and fear of a premature death respectively). These 29 items adopted a Likert scale format with responses ranging from 1 (‘Strongly agree’) to 5 (‘Strongly disagree’). Examples of the types of questions used in the scale were as follows, “I am afraid of dying very slowly” (fear of the dying process), “Discovering a dead body would be a horrifying experience” (fear of the dead), “I am afraid there is no afterlife” (fear of the unknown), “I am afraid I may never live to see my children grow up” (fear of a premature death) and “I am afraid of being buried alive” (fear of a conscious death). Added to the end of this scale was an item measuring deity-specific religious belief and was worded as, “I believe in a personal God (a being capable of hearing and answering prayers)”. This was included for exploratory purposes and will not be discussed further. A reliability analysis of the scale showed a good internal consistency between items with a Chronbach’s alpha score of .85.

The Vulnerability Questionnaire was a vulnerability measure adapted from the ‘Optimistic bias scale’ (Weinstein, 1980). The scale contained 15 questions designed to measure an individual’s perceived level of vulnerability. The questions asked the participant to rate their chances of a number of things happening to them. They were rated on a Likert format ranging from 1 (‘Much lower than average chance’) to 9 (‘Much higher than average chance’). To compute the score for the scale appropriate items were reversed scored then the items from the questionnaire were averaged together to give an overall rating of optimism (or at the other end of the scale,
vulnerability). A reliability analysis was conducted and returned a Chronbach’s alpha level of .81 suggesting good internal consistency. Questions included items such as, “What are your chances of having your home or apartment burglarized within the next five years, compared with an average person your age?” and “What are your chances of developing skin cancer in the next 10 years compared with an average person your age?”

Results: Study 1

2.4 The Effect of Killing on Fear of Death

The first research question of this study involved ascertaining whether the act of killing led to an increased fear of death. In order to examine this, an overall average rating was created for each participant on the Multidimensional Fear of Death Scale and these ratings were compared between the participants who thought they were killing (Think Killing condition) and participants who knew they were not killing (Know Not Killing condition) the bugs. It was hypothesised that if fear of death was being increased by the act of killing then those in the Think Killing condition should report higher fear of death scores than those in the Know Not Killing condition. Results of a 2-way (Think Killing vs. Know Not Killing) ANOVA suggested that there was no significant difference between the two conditions in terms of average score on the Multidimensional Fear of Death Scale, $F(1,43) = .15$, $p = .70$. Participants in the Think Killing ($M = 3.04$, $SD = .58$) and Know Not Killing
condition ($M = 3.12, SD = .63$) did not appear to differ in terms of their overall fear of death score.

In order to further extend this research question, the Multidimensional Fear of Death Scale was broken down into its five subscales as detailed by the authors of the scale. Once this occurred, analyses were conducted to test whether there was any significant difference between the participant’s scores in the Think Killing and Know Not Killing condition on any of the subscales. Five ANOVAs were conducted in order to check for any significant difference between the participants in Think Killing and Know Not Killing condition on each of the five subscales (see Table 1). None of these ANOVAs were significant with all five analyses returning p values of >.35.

**Table 1**

*Mean levels of fear of death scores (and standard deviations) on each of the five subscales of the Multidimensional Fear of Death Scale.*

<table>
<thead>
<tr>
<th>Subscale Measure</th>
<th>Dying Process</th>
<th>Dead</th>
<th>Unknown</th>
<th>Unconscious</th>
<th>Premature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Killing</td>
<td>3.59</td>
<td>.88</td>
<td>3.10</td>
<td>.75</td>
<td>2.50</td>
</tr>
<tr>
<td>Not Killing</td>
<td>3.68</td>
<td>.75</td>
<td>3.17</td>
<td>.51</td>
<td>2.34</td>
</tr>
</tbody>
</table>

**2.5 The Effect of Killing on Vulnerability**

The second primary research question was whether killing would induce feelings of vulnerability to death within an individual. To test this idea, a 2-way (Think Killing vs. Know Not Killing) ANOVA was carried out to test the effect of
condition on average vulnerability ratings on the Vulnerability Questionnaire. The hypothesis being that those who thought they were killing should have significantly higher average vulnerability scores than those who knew that they were not killing. Analysis of the difference in vulnerability scores between the Think Killing condition \((M = 4.60, SD = .82)\) and the Know Not Killing condition \((M = 4.53, SD = .94)\) showed this difference was not significant, \(F(1, 43) = .06, p = .80\).

**Discussion: Study 1.**

The results of the analysis of the fear of death subscale and vulnerability items did not support the hypothesis that killing increases fear or vulnerability to death. There was no significant difference between the Think Killing and Know Not Killing condition in terms of average overall score or subscale score on the Multidimensional Fear of Death Scale or average score on the Vulnerability Questionnaire.

In light of the null results two areas of further examination were explored. The first possibility centred on exploring different avenues for measuring fear of death. One potential limitation of the Multidimensional Fear of Death Scale is its lack of subtlety. Participants are given a clearly identifiable fear of death measure and are left in no doubt as to what is being measured as they fill out the questionnaire. This in itself produces its own problems as people may be tempted towards socially desirable responding which may include downplaying any fears of death (Crowne & Marlow, 1960).
It is also possible that in this case fear of death is operating at a more unconscious level meaning that participants may not be aware enough of fear of death to report it. For example, Terror Management Theory (Greenberg, Solomon & Pyszczynski, 1997) poses that humans naturally suppress fears of death and indeed it is evolutionarily adaptive to do so. If this were the case then an explicit measure like the Multidimensional Fear of Death Scale may not be appropriate as the participant may not be willing or able to disclose their fears through this measure.

Thus, in Study 2 a replication of Study 1 was repeated but included an implicit measure of fear of death based on the Go/No Go Association Task (Nosek & Banaji, 2001). This task was designed to measure the extent to which a participant associated their self with death compared with associating their self with life. These associations could then be used to tap into a participant’s feelings of vulnerability to death. In examining this two potential hypotheses arose. If a participant feels vulnerable to death then this might come through in a strong association between the self and death signalling their increased thinking about death and associating it with their self. However the opposite may also be true. If a participant is feeling vulnerable to death then perhaps they will be bothered by associating their self with death so will be poorer at making this association resulting in a stronger association between self and life relative to self and death.

Another possibility was that perhaps the fear of death and vulnerability questions utilised through the Multidimensional Fear of Death scale and the Vulnerability Questionnaire were not accurately asking about the type of fear of death and vulnerability elicited by this particular study, fear elicited by the act of killing. To
examine this, four fear of death questions were developed for use in Study 2 to better address the present study’s specific research questions.

Thirdly, it is possible that the effects of fear of death did not come through in Study 1 because these differences emerge only in certain types of people. To investigate this it was decided to examine the effects of individual differences on the effects of the extermination task. Previous research in this area suggests that perceived similarity could potentially have a strong moderating effect on the effects of killing on a participant (Martens et al, 2007). Specifically, this research suggested that for participants who rated themselves as having higher perceived similarity to the bugs greater initial killing led to greater subsequent killing on a self paced task (i.e. ‘killing begat killing’). Those who rated themselves as low in perceived similarity to the bugs did not show this effect. The authors of this study theorised that this effect may be due to participants who rate themselves as feeling more similar to bugs feeling greater dissonance while conducting the extermination task and as a result may kill more bugs in an attempt to alleviate this dissonance. If this was the case then a possible extension may be that perceived similarity affects a participant’s fear of death as killing something a participant rates as similar to them may serve to remind them of their own mortality and fragility of life thus increasing their own fear of death. In light of this, it was decided to measure ratings of perceived similarity of the participants to the bugs and examine whether high perceived similarity made participants more susceptible to increased fear and vulnerability to death following the extermination task.

As well as looking at the effects of the task on fear of death, it was decided to also examine the effects of fear of death and vulnerability on subsequent bug killing
behaviour. Lifton’s theorising suggests that vulnerability and fear of death are central motivating factors in the cycle of killing. Lifton suggests that killing may provoke feelings of fear and vulnerability to death but also that these increased feelings of fear and vulnerability to death may require further acts of killing to overcome these feelings. In order to examine this, the effect of level of feelings of fear and vulnerability to death on the number of bugs killed was examined. It was hypothesised that in the condition where participants thought that they were killing the bugs, participants with higher explicit and implicit fear and vulnerability to death would put bugs in the grinder than those who had lower levels of explicit and implicit fear and vulnerability to death.
Chapter 3: Study 2

Method

3.1 Participants

As in Study 1, Study 2 used a student sample from the University of Canterbury, recruited through advertising on the University’s notice boards and through the website of the introductory psychology course of the Department of Psychology. Sixty participants were recruited for this study. Thirty-six participants were recruited through the advertisements placed around the University of Canterbury and were financially compensated for their participation with 10-dollar shopping vouchers. The remaining 24 participants were undergraduate introductory psychology students from the University of Canterbury who completed the study as a requirement for course credit.

Of the 60 participants recruited, three withdrew after reading the information sheet and being informed of the nature of the study, citing that they did not feel comfortable with conducting the bug extermination task required of them. A further two participants were later excluded from analyses as they either had participated in similar bug-killing experiments or reported significant prior understanding of the research being conducted in the present study. Therefore, a total of 55 participants
were used for the final analysis (12 males and 43 females). The age of these participants ranged from 17 to 46, with a mean age of 24.65.

3.2 Procedure

*Introducing the experiment and cover story*

The participant arrived at the lab where they were greeted by the experimenter. The participant then received a similar cover story to the one implemented in Study 1. In short, the participants were told that “the study is looking human-animal interactions and in this particular study we are looking at the role of exterminators who deal with bugs. What you will be doing in this study is a short bug extermination task as well as filling out some questionnaires designed to measure what is going on for you as you complete the task”. Following this the participants were then given a consent form to fill in as well as a measure designed to measure empathy, perspective taking and personal distress as well as participant’s levels of disgust and perceived similarity to the bugs\(^1\). This Initial Questionnaire was based on the Davis Interpersonal Reactivity Index (Davis, 1980) and included two items designed to assess perceived similarity to bugs and disgust at killing bugs. If a participant declined to proceed with the study they were debriefed by the experimenter who revealed the true nature of the study and answered any questions that the participant might have had.

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\(^1\) Participant’s levels of empathy, perspective taking and ability to cope with personal distress were measured for exploratory purposes but will not be discussed further.
Condition assignment and explanation

Once they had completed the Initial Questionnaire the participant was taken to the bug killing apparatus and shown the slaters that they would be working with. The experiment was set up in the same way as it was in Study 1 with the bug grinder being placed next to a tray with five rows of five containers. As in Study 1, participants were randomly assigned to one of two conditions. In the first condition participants were given a closer look at the grinder and were shown that the tube into the grinder was blocked off meaning no bugs would be killed. In the second condition this information was withheld from the participants (until the completion of the study).

The Practice Task, Personality Questionnaire and GNAT

As in Study 1, the participant was asked to demonstrate their understanding of how to operate the bug killing apparatus by tipping a slater into the grinder and activating the grinder by holding the switch down on the grinder. Following this, the participant was then taken to a cubicle where they were given a measure developed to detect the implicit association between self and life/self and death. The measure was an adaptation of the Go/No Go Association Task, or GNAT (Nosek & Banaji, 2001). The experimenter informed the participant that they would be “taking part in a word-reaction task to check reaction times as reaction speed will affect how you go on the extermination task and may be something we want to look at”. The experimenter then
went through the instructions of the task with the participant to ensure they knew what was required. Following this, the participant was informed they were going to be “given two practice word-reaction tasks to ensure you become familiar with the task”. In short, the GNAT entailed that the participant goes through a list of words while identifying a set of target words specified at the start of the measure. These target words comprised of words relating to the ‘self’ and words relating to ‘life’ or ‘death’. The speed at which the participant completed the measure gave an indication of the speed of association of self with life and death for that participant.

Following this, the participant was given the Personality Questionnaire, a measure designed to gauge a participant’s level of fear of death, dissociation and vulnerability (see Appendix 7). While the participant was completing this, the experimenter checked to make sure everything was appropriately set up for the extermination task, in which the number of bugs a participant killed was to be measured, and set the timer. When the participant had completed the Personality Questionnaire, the experimenter collected the questionnaires and ushered the participant back to the bug killing apparatus.

The Extermination Task

The participant was then instructed to begin a short bug extermination task, exactly as in Study 1, with experimenter leaving the room and the participant having 25 seconds to put bugs into the grinder “going at their own pace”. When the participant had finished the extermination task the experimenter took the participant back around to the first cubicle. The participant was instructed to “sit tight once you’ve finished and I’ll be back with you shortly”. While the participant was waiting,
the experimenter collected and counted the number of bugs put into the grinder during the extermination task and moved the bugs back to their habitat.

Suspicion Test and Debriefing

Similar suspicion tests and debriefing used in Study 1 were employed in Study 2. The essential differences being that the suspicion test in Study 2 also included questions to probe for any participant suspicions of the nature of the questionnaires used specific to Study 2 and to ascertain any suspicions pertaining to the research questions particular to Study 2. The debriefing was likewise extended to explain specifically what Study 2 hoped to address and how the research design achieved this. Participants were given an opportunity to express concerns and then were given their remuneration for participating in the study and asked to fill out a re-consent form. After the participant left, the experimenter prepared the laboratory for the next participant.

3.3 Materials

The Bug Killing Apparatus and the Bugs

The same bug killing apparatus and species of bugs from Study 1 were used in Study 2.
The Initial Questionnaire

The Initial Questionnaire was given to each participant. This was a 30-item questionnaire designed to look at a number of personality attributes of participants completing the study. The questionnaire was based on Davis Interpersonal Reactivity Index (Davis, 1980) with research suggesting that this index has good internal and test-retest reliability (Davis, 1980; Davis & Franzoi, 1991). Participants were asked to identify the degree to which they felt a number of statements described them and give a rating from 1 (‘does not describe me well’) to 4 (‘describes me very well’). The question of interest for this study was the item designed to ascertain the degree to which the participant perceived themselves as similar to the bugs they were working with. The question was worded ‘I can see a number of similarities between humans and bugs’. Participants who responded with higher ratings on this item were deemed to have a higher degree of perceived similarity to the bugs used in the study.

Implicit Death Measure

In order to measure any implicit association between self and death an existing implicit association measure was modified. Early measures of implicit attitudes regarding categories-attribute associations were problematic as they required a second category in the measurement context which meant that individual categories could not be looked at as they were always presented within the context of another contrasting category (Nosek & Banaji, 2001). This was problematic for the present study as one of the pivotal research questions was to examine the association between
‘self’ (category) and ‘death’ or ‘life’ (attribute) without the presence of a contrasting category.

In order to gain an implicit measure of the association between self and death and self and life that could be successfully used without the presence of a contrasting category a pen and paper version of the Go/No-Go Association Task (Nosek & Banaji, 2001) was developed. The Go/No-Go Association Task (GNAT) was developed to test the strength of an association between a target category (e.g. fruit) and two poles of an attribute dimension (e.g. good vs. bad). The GNAT enables a researcher to accurately test the degree to which an attribute is related to a given category (e.g. whether ‘good’ or ‘bad’ is more strongly associated with ‘fruit’). The advantage of the GNAT over other implicit association measures is that the GNAT can measure an association between a category and an attribute without necessarily including another opposing category.

The computer version achieves this by presenting a participant with a category (e.g. fruit) and attribute (e.g. good) displayed in the upper left and right quadrants of the screen. The program flashes a word on the centre of the screen. The participant is instructed that if a word is associated with either the category or the attribute then the participant is to hit the space-bar (‘Go’). If the word does not belong to the category/attribute then the participant is to do nothing (‘No-Go’). This can be done for a variety of categories and attributes in a single sitting. Response times can then be calculated in order to determine whether a person is faster at associating certain category-attribute pairings. As each trial is separate a response can be compared both within trials and across trials, meaning single category-attribute associations can be compared as themselves as well as against other category-attribute associations.
Four implicit association tasks were developed in order to provide an implicit measure of the association between self and death and self and life; two were practice tasks (‘Fruit GNATs’) while the remaining two were test tasks (‘Self GNATs’). The practice tasks were designed to measure the participant’s attributions towards fruit (good vs. bad) and served to establish whether the pen and paper task could accurately measure implicit associations (see Appendices 8 & 9). The test tasks were designed to measure a participant’s implicit associations between self and both life and death (see Appendices 10 & 11).

The first test task contained an introductory paragraph outlining the task. These instructions informed the participant that they were to go through a list of words and if any one of the words from the two categories listed appeared they were to make a tick in the check-box next to the word. If another word appeared they were to leave it blank and move onto the next word. The instructions also informed participants that they were being timed so to carry out the task as quickly but also as accurately as possible. At the end of this introduction were six words divided into either a category (‘self’) or an attribute (either ‘life’ or ‘death’) which the participant was to look out for in the list of words. These were words associated with ‘self’ (me, mine and my) and words associated with ‘life’ (life, live and living). Below this section were two lists placed on either side of the page containing a total of 48 words. Next to each word was a check-box. The words in this list contained a combination of target words and distracter items. The distracter items were the target attribute items from the other test task (i.e. target attribute items to do with ‘life’ became distracter items in the second task where target attribute items were to do with ‘death’ and vice versa). The ratio of target to distracter items was set at four target items to every three
distracter items. This ratio was chosen as it mirrored the ratio chosen and successfully implemented in similar experiments using the computerised GNAT design (Nosek & Banaji, 2001). The second test task was set out the same as the first test task with one exception. While the ‘self’ category remained the same, a category of three words to do with ‘death’ (death, die and dying) replaced the ‘life’ words category with the life words becoming the distracter items in the word list.

The control tasks were likewise set out in a similar fashion, however the target category was words to do with the “fruit” (apple, orange and plum) and the target attribute category was either words to do with “good” (happy, joyful and terrific) or words to do with “bad” (angry, horrible and terrible). The control tasks were used to ensure that the adaptation of the GNAT to a pen and paper task was still effective in measuring implicit associations by using the target and distracter items used by Nosek & Banaji (2001) to attempt to replicate their results.

The Personality Questionnaire

This was a twelve-item questionnaire designed to measure elements of particular investigative interest to Study 2. The questions were based on a Likert-scale format with participants answering from 1 (‘Strongly Disagree’) to 7 (‘Strongly Agree’). The questionnaire covered three different research areas. The first area looked at fear of death and contained the research questions “How afraid of your own death are you?”, “How much does your own death concern you?”, “How in touch with your own mortality are you?” and “How vulnerable to death do you feel?” The second area looked at dissociation (e.g. ‘During the practice extermination procedure,
I felt what was happening didn’t seem real, like I was in a dream or watching a movie. The final area looked at vulnerability (‘How vulnerable do you feel right now?’).

**Results: Study 2**

3.4 The Effect of Initial Perceived Similarity on Explicit Fear of Death Responses

One of the central avenues of exploration for Study 2 was to look at the effect of condition on explicit fear of death and to see whether this effect was moderated by participant’s level of initial perceived similarity to the bugs. As mentioned earlier it was hypothesised that participants with higher initial perceived similarity ratings who thought that they were killing would have increased feelings of fear and vulnerability to death as they would be reminded more of their own mortality when completing the bug killing task. In order to test this, a series of linear regressions were conducted to see the whether there were any main effects and an interaction between condition (Think Killing vs. Know Not Killing) and initial perceived similarity (High vs. Low) on each of the four fear of death items from the Personality Questionnaire. These items were “‘How afraid of your own death are you?’”, “‘How much does your own death concern you?’”, “‘How in touch with your own mortality are you?’” and “‘How vulnerable to death do you feel?’”
The only fear of death question to achieve significant results was the extent to which participants felt vulnerable to death (i.e. ‘How vulnerable to death are you?’) and whether this was moderated by initial perceived similarity. The remaining three fear of death questions all had main effects and interactions with p values of less than .35. The results using the vulnerable to death question showed no significant main effect of condition, $\beta = .30, SE = .70, t = .42, p = .67$. However, there was a significant main effect of initial perceived similarity, $\beta = 1.37, SE = .65, t = 2.12, p = .04$. This result suggests a positive relationship between initial perceived similarity to the bugs and ratings of vulnerability to death with participant’s ratings of vulnerability increasing as ratings of initial perceived similarity increased. Qualifying this effect was a near significant interaction between condition and initial perceived similarity on vulnerability to death, $\beta = -.72, SE = .43, t = -1.70, p = .09$.

To further examine this interaction, the relationship between the killing condition manipulation on feelings of vulnerability to death was analysed separately at two levels of the initial perceived similarity measure, one standard deviation above and one standard deviation below the mean (Aitken & West, 1991). The analysis involved plotting separate regression lines at these two levels of the moderator (initial perceived similarity) and testing for significance.
Figure 4: The effect of condition on vulnerability to death at two levels of perceived similarity to the bug

Looking at the results (see Figure 4) at one standard deviation below the initial perceived similarity mean there was no difference between the two conditions, $\beta = 0.07, SE = .19, t = .12, p = .90$. However, at one standard deviation above the mean initial perceived similarity there was a significant difference between the two conditions, $\beta = -1.37, SE = .19, t = -2.34, p = .02$. This suggests that participants who thought that they were killing the bugs and perceived themselves to be more similar to bugs expressed higher feelings of vulnerability to death following the task than those who knew they weren’t killing the bugs. This could be due to participants with higher ratings of perceived similarity to the bugs being reminded more of their own mortality as a result of killing the bug leading to an increase in reported vulnerability to death scores.
This result provides support for the hypothesis that killing leads to feelings of vulnerability to death by suggesting that if a participant perceives themselves to be similar to the bug then killing appears to make the participant feel more vulnerable to death.

3.5 The Effect of Initial Perceived Similarity on Implicit Fear of Death Responses

As well as looking at the effect of initial perceived similarity on the relationship between condition and explicit fear of death variables, this study sought to examine the effect of initial perceived similarity on the relationship between condition and an implicit death variable. In order to examine this, the association of life vs. death with self, as measured by the GNAT (outlined earlier), was used as the dependent variable. The participant’s scores on the Self-Death measure were taken away from the participant’s scores on the Self-Life measure to create a single death/life variable. High positive scores on this variable indicated a faster association of self with life than self with death.

Results showed a non significant main effect of condition on number of bugs killed, $\beta = 2.48$, $SE = 2.18$, $t = 1.14$, $p = .26$. A significant main effect of initial perceived similarity was found, $\beta = 4.05$, $SE = 2.00$, $t = 2.02$, $p = .05$. This result suggested a positive association between initial perceived similarity and implicit fear of death suggesting that increased initial perceived similarity is linked to increased association of self with life regardless of condition. This main effects was further qualified by a near significant interaction effect, $\beta = -2.32$, $SE = 1.32$, $t = -1.77$, $p = .08$. 
To expand on this interaction further, the relationship between condition and implicit fear of death was analysed separately for high and low levels of initial perceived similarity (one standard deviation above and one standard deviation below the mean). Looking at the results presented in Figure 5 it can be concluded that at one standard deviation below the initial perceived similarity mean there was no difference between the Think Kill and Know Not Killing conditions, $\beta = 1.76, SE = .20, t = .94, p = .35$. At one standard deviation above the initial perceived similarity mean the effect of condition approached significance, $\beta = -2.89, SE = .19, t = -1.59, p = .12$. As visual examination of the results suggests that higher initial perceived similarity is associated with a larger association of self with life in the Think Killing condition with the opposite association of self with death occurring in the Know Not Killing condition. However, neither of these results achieved significance.

**Figure 5: The effect of condition on the implicit fear of death measure at two levels of initial perceived similarity to the bug.**
To look at the results from another angle, the results were analysed to see if there were any significant effects of initial perceived similarity within the Think Killing and Know Not Killing condition (see Figure 6). Participants in the Know Not Killing condition in the low initial perceived similarity group did not have significantly different association scores compared with those in the high initial perceived similarity group, $\beta = -0.61$, $SE = .21$, $t = -0.61$, $p = .54$. However, participants in the Think Kill condition in the low initial perceived similarity group did have significantly different association scores compared to the high initial perceived similarity group with participants in the high initial perceived similarity group having a higher association of self with life than those in the low initial perceived similarity group, $\beta = 1.72$, $SE = .17$, $t = 1.98$, $p = .05$.

**Figure 6: Condition effects of initial perceived similarity on implicit fear of death**

![Graph showing association score against perceived similarity](image)

These results suggest although there is not normally a strong association between self and life after killing (i.e. in the Know Not Killing condition), high initial
perceived similarity predicts a greater association of self with life. At first blush this result could be interpreted as an indication that participants with high perceived similarity were less affected by killing which led to the greater association of self with life. However, this result needs to be considered in light of earlier results which suggest that high initial perceived similarity is linked to feelings of a greater vulnerability to death following killing a bug. Seen in this light it is less likely that the association scores in the Think Killing condition between self and life seen in those with high initial perceived similarity are due to a reduction in feelings of vulnerability to death. Perhaps what is happening in this measure is that participants who killed one bug with high initial perceived similarity scores are impeded in making the association between self and death as this death-self association is more threatening (due their increased levels of vulnerability to death).

In order to ensure that the this effect was occurring on the association between self and death/life as opposed to generally enhancing an individual’s association speed, a linear regression was conducted to check the interaction of condition and initial perceived similarity on the fruit good/bad association (the control task). If a significant interaction occurs on this task then it could be argued that the effect of condition and initial perceived similarity is on the speed and accuracy of association in general rather than a specific association between self and death/life. As in the analysis between self and life/death, an association score for Fruit was made by taking the participant’s score on the Fruit-Good association task away from their score on the Fruit-Bad association task. Higher positive scores indicated a stronger association with Fruit and Good as opposed to Fruit and Bad.
The results of the regression showed no significant main effects or interaction with all p values being greater than .35. This suggests that the significant interaction effect between condition and initial perceived similarity on self and death/life is occurring on the specific association between self and death/life rather than a general effect on association strength.

The results partially support the hypothesis that higher initial perceived similarity will lead participants who kill to show a greater association with self and life. The results suggest a clear difference between the low and high initial perceived similarity participants in the Think Killing condition with the high initial perceived similarity participants having higher association scores than the low initial perceived similarity participants.

3.6 The Effect of Initial Perceived Similarity on Vulnerability Responses.

It was hypothesised that for the participants who thought that they were killing the bugs, high initial perceived similarity should be associated with high ratings of vulnerability to death. In order to check whether killing had an effect on vulnerability specifically or vulnerability in general, a composite variable of each participant’s average response on the four vulnerability questions in the Personality Questionnaire was used as the outcome variable. Results suggest that the main effects of condition and initial perceived similarity and their interaction were non-significant with all three p values being greater than .21. This result suggests that perceived similarity does not have an effect on general levels of vulnerability but instead has an effect specifically on vulnerability to death.
3.7 Moderator Effects on Number Killed

One of the key components of Lifton’s theory on the interaction between fear and vulnerability to death and killing was that killing has the potential to fuel subsequent killing to reassert a sense of power and control over the feelings of fear and vulnerability to death provoked by an act of killing. Earlier, it was apparent that killing a bug did lead to a sense of greater vulnerability to death, both implicitly and explicitly when taking into account a participant’s level of perceived similarity to the bug. Given that this is the case a further avenue to be explored was whether this increased feeling of vulnerability to death reported in participants led to a greater number of bugs killed when the participants thought they were killing the bugs. If this was supported by the results then it would give empirical credence to Lifton’s theorising that increased feelings of vulnerability to death acts to increase killing behaviour. In order to study examine this idea two analyses were conducted. The first involved looking at the effect of condition moderated by explicit vulnerability to death on number of bugs killed during the 25 second extermination task. The second analysis looked at the effect of condition moderated by the implicit association with death scores on number of bugs killed during the 25 second task.

a.) The Effect of Vulnerability to Death on Number of Bugs Killed

Results showed a main effect of condition on number killed, $\beta = 12.10, SE = 4.21, t = 2.87, p = .006$. The direction of means show a higher number of bugs killed in the Know Not Killing condition ($M = 11.11, SD = 6.05$) than the Think Killing
condition ($M = 6.14, SD = 6.25$). There was also a close to significant main effect of Vulnerability to Death, $\beta = 2.30, SE = 1.50, t = 1.73, p = .09$. This result suggests a positive relationship between vulnerability to death and number of bugs killed with higher vulnerability to death being linked with killing more bugs. As well as the main effects there was a close to significant interaction between condition and vulnerability to death on number killed, $\beta = -1.89, SE = 1.04, t = -1.82, p = .07$.

To further detail this interaction the relationship between condition and number killed of bugs killed was analysed separately for participants with vulnerability to death ratings one standard deviation above and one standard deviation below the mean vulnerability to death rating as moderated by condition (see Figure 7). Analysis of the simple slopes suggest that within the Think Killing condition there was no significant difference between high and low vulnerability to death on number of bugs killed, $\beta = 0.71, SE = .187, t = 1.12, p = .27$. In the Know Not Killing condition a close significant difference between high and low vulnerability to death on number of bugs killed was found with participants with high vulnerability to death ratings putting more bugs in during the 25 second extermination task than participants with low vulnerability to death ratings, $\beta = -1.48, SE = .196, t = -1.22, p = .13$. 
Figure 7: The effect of vulnerability to death on the number of bugs killed at the two levels of condition

Overall, feelings of higher vulnerability to death appear to be associated with a greater number of bugs killed regardless of condition. The close to significant interaction suggests that condition may have an effect on this relationship with participants killing a more restricted range of bugs when participants thought that they were killing the bugs than when the participants knew that they were not killing the bugs. The close to significant results in the Know Not Killing condition suggest that there is a tendency for participants with a higher feelings of vulnerability to death to kill more bugs compared to those with a low feelings of vulnerability to death. However this effect appears to be reduced in the Think Killing condition. This may be due to the significant effect of condition on number of bugs killed. Overall participants in the Think Killing condition killed less bugs than those in the Know Not Killing condition which can be explained by participants in the Think Killing condition being more inhibited than those in the Know Not Killing condition as they believed they are killing the bugs, whereas those in the Know Not Killing condition
were aware they were not. While this could be seen as deviating from Lifton’s theorising by suggesting knowledge of killing is an inhibitory factor rather than a motivating one it may equally suggest that this inhibitory effect is a psychological hurdle that an individual needs to overcome before vulnerability to death has its exacerbating effect on the killing process.

b.) The Effect of Implicit Fear of Death on Number of Bugs Killed

As well as looking at the effects of explicit vulnerability to death on number of bugs killed this study also sought to understand the effect of implicit vulnerability to death on number of bugs killed. Earlier it was discovered that participants who rated themselves as comparatively more similar to the bugs showed a weaker association of the self with death. Participants with high perceived similarity to bugs ratings also had greater ratings of feelings of vulnerability to death following the practice extermination task. Taking this into account, it could be argued that the weak self-death associations seen in high perceived similarity participants are an implicit aspect of vulnerability to death perhaps because the feelings of vulnerability to death the high perceived similarity participants feel makes them less willing or able to make quick self-death associations. If implicit vulnerability, as measured by the implicit association task, was related to explicit vulnerability then there should be a positive correlation between the implicit association measure and the explicit feelings of vulnerability to death measure. A correlation was conducted which found that this relationship did not appear to exist, $r = .09, p = .20$. Based on Lifton’s theorising there should also be an association between the implicit feelings of vulnerability to death scores and condition on number of bugs killed, with participants with low self-
death association scores in the kill condition putting in the greatest number of bugs during the 25 second extermination task.

The results of a linear regression between condition and the association of self with life/death on number of bugs killed show a significant main effect of condition on number of bugs killed ($\beta = 5.23, SE = 1.76, t = 2.98, p = .004$) with participants in the Know Not Killing condition killing less bugs than those in the Think Killing condition. The main effect of association of self with life/death on number of bugs killed was non-significant ($\beta = 0.32, SE = .54, t = .59, p = .57$) as was the interaction between condition and association of self with life/death on number of bugs killed ($\beta = -.17, SE = .36, t = -.45, p = .65$). These results are inconsistent with the hypothesis that lower self-death association scores would be associated with an increased number of bugs killed in the Think Killing condition.
Chapter 4: General Discussion

4.1 Summary

The present studies provide some initial support for the hypothesis that killing can lead to a participant feeling both explicitly more vulnerable to death and implicitly showing a reluctance to associate their self with death. However, the studies also suggest that the relationship between killing and feelings of vulnerability to death is a complex one, with significant changes in explicit and implicit feelings of vulnerability to death occurring only in those participants with high ratings of perceived similarity to the bugs used in the extermination task. Furthermore, although participant’s levels of increased feelings of vulnerability to death were associated with a higher number of bugs killed during the extermination task, this effect was not significant in the condition where participants thought that they were killing the bugs which was contrary to the hypothesis and needs further exploration.

Study 1 sought to examine a direct relationship between killing and fear of death. It was hypothesised that participants who thought that they were killing the bugs would report higher fear of death scores and higher vulnerability scores compared to participants who knew that they were not killing the bugs. To study this, participant questionnaire ratings were analysed to find out whether participants who thought that they were killing the bugs during the extermination task did have higher feelings of fear of death and vulnerability scores than those participants who knew
that they were not killing the bugs during the extermination task. The results showed no significant differences in fear of death or vulnerability between the participants who thought that they were killing the bugs and those who knew that they were not which failed to support the hypothesis that killing leads to increased feelings of fear of death and vulnerability in participants.

To follow up Study 1, Study 2 examined the potential moderating effect of individual differences in perceived similarity to the bugs used in the extermination task. It was reasoned that perceived similarity might moderate the effects of killing on provoking feelings of fear and vulnerability to death because participants who felt similar to the bugs may more readily associate the killing of the bugs with the fragility of their own life and as a result the task may be more likely to increase the participant’s own feelings of fear and vulnerability to death. In addition, the fear of death measure was changed to more effectively tap into the thoughts and feelings that were hypothesised to be provoked by killing. While the Multidimensional Fear of Death Scale provided a valid measure of fear of death it was possible that it did not adequately tap into other thoughts associated with killing such as concerns about death and vulnerability to death. To address this, specific questions were designed and included in Study 2 to examine areas of concern, rumination and vulnerability to do with death as well as fear of death. An implicit association measure was also included designed to examine the extent to which participants subconsciously associated their self with both death and life.

The results of Study 2 showed that participants who reported high ratings of perceived similarity to the bugs had increased feelings of vulnerability to death as a result of killing the bugs. This effect was present only for participants who thought
they were killing the bugs suggesting that this effect was a result of the act of killing providing support for the hypothesis that killing leads to feelings of vulnerability to death, but suggests a high degree of perceived similarity between the participant and the bug is important for this to occur.

As well as having an effect on explicit fear of death, Study 2 found that participants who reported higher perceived similarity to the bugs had a much greater change in association of their self with life compared to those who reported a low initial perceived similarity to bugs. As with the explicit measure of feeling increased vulnerability to death, this effect was present only in the condition where participants thought they were killing the bugs. The change in association strength indicated a preference for participants to associate their self with life rather than death. The results suggest that participants with high perceived similarity either associate self with life faster or are impaired in associating self with death. The previously reported significant result between killing and explicit feelings of vulnerability death suggests that increased feelings of vulnerability to death is a strong potential factor in this association change. Taking this into account, the implicit fear of death results suggest that participants who kill are either associating their self more with life/less with death as a means of distancing themselves from the feelings of vulnerability to death aroused from perpetrating an act of killing. However, again this result is present only for those participants who report a high degree of similarity to the bugs killed in the extermination task suggesting that the relationship between the participant and the bug is an important factor to take into account. The significant effect of perceived similarity as a moderating factor between killing and its psychological impact is consistent with and supports the previously cited research by Martens and others (2007).
Finally, Study 2 examined the extent to which explicitly stated and implicit vulnerability to death affected how the participant performed on the extermination task. The explicit vulnerability to death measure was used as a moderating variable in the relationship between condition and number of bugs killed during the extermination task. The results suggest that overall there is a tendency for participants reporting high feelings of vulnerability to death to put more bugs into the grinder than those reporting low vulnerability to death. However, the effect of killing appeared to diminish this main effect with this effect becoming non-significant in the condition where participants thought they were killing the bugs. This itself is of interest as it was expected that this effect would only be present in the condition where participants thought that they were killing. Although unexpected, this result may serve to highlight an important aspect of the act of killing. This result may suggest that initially, the act of killing itself may present itself as a psychological ‘hurdle’ that needs to be overcome before feelings of vulnerability to death have a strong effect. However, it should be noted that this effect was not mirrored in the relationship between implicit vulnerability to death and bug killing with no significant relationship found.

4.2 Limitations and Strengths

This research provides some initial evidence to suggest that feelings of vulnerability to death can be provoked by the act of killing. These studies expand and extend earlier research using the bug killing paradigm to experimentally measure conditions that affect killing behaviour. However, interpretation of these results does need to be conducted with a degree of caution. The use of the bug extermination task
is advantageous as it allows a researcher to empirically study and manipulate factors that influence the killing process. For obvious reasons, experimental study the effect killing has on a human is difficult to perform and the approach used in this study represents an innovative way to address this. However, the advantages of this inevitably have a trade-off in other areas of the study. The first and most obvious is that killing a bug is a different matter to killing another human being. As well as this, the laboratory environment, including the use of the “bug grinder” as the extermination apparatus, is removed from how killing actually occurs in a natural environment. This highlights the problem in laboratory research of the trade-off of control over environmental factors versus the reduction in generalisability of the study. While this research design gives the researcher greater control over the study it comes with a sacrifice in the generalisability of the research. Therefore, care is encouraged in application of these findings to conflict involving humans and it is encouraged that this research be viewed in conjunction with existing studies that have looked at the effects and outcomes of killing in a real world setting.

To this end, it is interesting to note that there are some analogies between this study and some real world examples of conflict. Victims of genocide often are referred to and seen as by the aggressors as “cockroaches” or “vermin” (Martens et al, 2007). As well as this, the strong influence of perceived similarity as a moderator itself suggests that generalisations to human conflict could be made. There is obviously a gulf between the similarity of a human with a bug and the similarity of a human with another human. However, the influence of initial perceived similarity on increasing participants’ feelings of vulnerability to death suggests the effects noted in this paradigm might be exacerbated in a scenario where humans killed other humans. If high similarity to a bug produces greater vulnerability when a bug is killed then it
is likely that the impact of killing another human, who the perpetrator would presumably see as substantially more similar to themselves, should be even greater.

4.3 Alternative Explanations

The primary finding was that among participants who reported high perceived similarity to the bugs, killing led to feeling increased vulnerability to death. One possible alternative explanation for this effect is that perhaps it is witnessing the task rather than participation in the task itself that motivates any psychological impact reported. In other words, perhaps seeing the bug being put in the grinder and being killed is causing the feelings of vulnerability to death and these feelings are independent of whether the participant actually kills the bug themselves or not. As Lifton hypothesises that it is the act of killing itself that is important this confound needs to be explored. Future research could benefit from including an extra condition where participants either conduct the extermination task themselves, as in these studies, or observe the researcher conducting the same task. If the results noted in this study occurred when the participant did the extermination task but did not occur in the condition where the researcher was conducting the extermination task then it would support the hypothesis that the actual act of killing is leading to the psychological changes observed, rather than the witnessing of such a situation. However, this does not diminish from the fact that, whether it is through witnessing or actual perpetration, killing leads to increased feelings of vulnerability to death.

One of the more perplexing results was the finding that of the four fear of death items it was the item ‘vulnerability to death’ that was both affected by killing and had salient effects on future killing. Why the other three fear of death items did
not achieve a result is an area worthy of exploration. Some participants reported that ‘fear’ and ‘concern’ with death seemed to imply a level of rumination that they didn’t feel occurred for them. However ‘vulnerability’ instead had connotations of feeling helpless and not in control which were more relevant to their feelings towards death. Lifton’s theory refers to a motivation to gain the ‘omnipotence’ necessary to overcome the feelings provoked by killing and it is possible that the ‘vulnerability to death item’ was the most able to encapsulate those feelings. Future research is needed to explore whether the effect of killing provoking feelings of vulnerability to death can be replicated and if so examine whether participants do view the meaning of vulnerability to death in a different way to the other fear of death questions.

It is also important to note that the results of the death association measure are subject to interpretation. The results gained from this measure were perplexing as they suggested those who thought they were killing the bugs were associating their self with death less than those who knew they weren’t killing the bugs. This result was taken as suggesting that participants who thought they were killing the bugs had a greater association with self and life as a defence against feelings of vulnerability brought up by conducting the extermination task. Consistent with this possibility, participants who thought they were killing the bugs had higher explicit feelings of vulnerability to death scores, as noted in earlier results.

However it is also possible to interpret the stronger association scores of self with life in those who thought they were killing as instead an indication of invulnerability. Perhaps participants were more able to associate their self with life as the act of killing giving them a sense of power and control, which meant they weren’t bothered on a subconscious level by feelings of vulnerability to death. Although this
explanation is opposite to the rationale for the findings between killing and explicit vulnerability to death this could be explained by the differences between explicit and implicit measures of psychological mechanisms. Research suggests that there may be a distinct difference between a person’s conception of their implicit and explicit feelings of vulnerability (Engelhard, Huijing, van de Hout & de Jong, 2007). It is entirely possible that the effect of killing leads to a conscious expression of fear but subconsciously fear is reduced. Such an explanation could fit in with Lifton’s theorising that there is an interesting dichotomy between killing and vulnerability where the act of killing increases feelings of vulnerability but at the same time conveys a feeling of omnipotence that allows the perpetrator to feel less vulnerable (Lifton, 1986).

The difference in interpretation of the implicit association results offer ideas for future exploration and would be a worthy avenue for future research. Future studies could use different implicit association tests, such as the Word Completion Task (Anderson et al, 2004) to see whether a participant engaged in killing in the bug killing paradigm feels implicit vulnerability that match with their explicit measures of vulnerability, a sense of power/invulnerability or some other psychological response entirely.

It was also interesting to note that the effect of vulnerability to death on increasing the number of bugs killed was present when participants knew they were not killing the bugs but was reduced to non-significance when participants thought that they were killing the bugs. It would be valuable in future research explore what is behind this effect. Is the act of killing itself the deterrent which minimises the effect of increased feelings of vulnerability to death on number of bugs killed or does the
act of killing lead to participants behaving in different way (e.g. dissociating) which itself minimises this effect). It would also be useful to explore the non-significant results between implicit feelings of vulnerability to death and number of bugs killed and establish if this too is the result of the aforementioned dichotomy between explicit and implicit feelings of vulnerability to death or whether this is due to an alternative explanation.

Finally, it is worth bearing in mind that as perceived similarity was measured and not manipulated meaning any differences in perceived similarity noted in the study could be due to an unmeasured third variable that varies with individual differences in similarity. Perhaps participant ratings of perceived similarity to the bugs are tied in with a variable such as sensitivity. A person with high levels of sensitivity is more likely to be able to access their emotions regarding an event and as such may enable a participant to better connect with what is happening to the bug. This may suggest sensitivity is likely to be positively associated with perceived similarity meaning high levels of sensitivity are likely to manifest themselves alongside participants with high perceived similarity creating a potential confound if sensitivity is not also measured. This confound becomes significant if in fact sensitivity turns out to be the relevant moderating variable in the place of perceived similarity. For example, a participant with a higher rating of sensitivity may be more affected by environmental influences such as the noise of the grinder and as a result may manifest feelings of vulnerability to death that are not directly due to the effect of killing. Follow up research would benefit from both monitoring levels of potential third variables and actively manipulating a participant’s perceived similarity to establish the causal link between this variable and feelings of vulnerability to death provoked by killing.
4.4 Future Research and Implications

Throughout the course of the discussion a number of suggestions for future research have been made to improve or elaborate on current findings. However, another unmentioned avenue for future exploration is incorporating the theoretical perspective of Terror Management Theory (TMT). TMT was influenced by the work of Ernest Becker (1973) who theorised on the importance of fear of death in the human condition. Becker (1973) suggested that human beings are unique in our ability to contemplate our own mortality. The ability to do this means that we are able to understand that one day we will cease to exist and there is nothing that can be done to prevent this. This realisation has the potential to create debilitating anxiety which humans have to overcome to be able to function in the world. ‘The idea of death, the fear of it, haunts the human animal like nothing else; it is a mainspring of human activity - designed largely to avoid the fatality of death, to overcome it by denying in some way that it is the final destiny of man’ (Becker, 1973, p.ix).

TMT hypothesises that in order to allay the anxiety provoked by fear of death, humans create ‘worldviews’ which bring meaning to the world and allow an individual to buffer themselves from fear of death. Broadly defined, worldviews are cultural and social constructs that provide an individual with structure and meaning to their life. This enables an individual to gain a sense of literal or symbolic immortality that buffers them from their fear of death (Greenberg et al, 1997). For example a good parent may take pride in raising a child to carry on their genes and legacy (symbolic immortality) whereas a good Christian has faith in the promise of a place in heaven if they follow their beliefs (literal immortality). Effective terror management comprises
of two things, faith in a meaningful conception of reality and belief that one is meeting the standards prescribed by that reality (Greenberg et al, 1997). TMT hypothesises that living up to the expectations of these worldviews allows a person to have high self-esteem, which in turn buffers the individual from thoughts and fears of death.

A large and growing body of research has emerged to support the tenets of TMT. If worldviews are created as a means of buffering a person from death anxiety then making a person think about their own death should increase the person’s desire to maintain their worldview. Indeed, a number of studies have shown that making an individual more aware of their mortality instigates an increased maintenance of that individual’s worldview (Galliott, Stillman, Schmeichel, Maner & Plant, 2009; Landau, Solomon, Greenberg, Cohen, Pyszczynski, Arndt, et al. 2004; Greenberg et al, 1997). The maintenance of a person’s worldview can take a variety of forms and can be used to explain a number of behaviours. The effect of mortality salience and worldview defence can be linked to behaviours such as prejudice (Galliott et al, 2009), anti-Semitism (Cohen, F., Jussim, L., Harber & Bashin, 2009) and aggression (Lieberman, Arndt, Personius & Cook, 2001) against people who threaten one’s worldview.

The results of the present studies may provide some interesting additional information that could be linked with TMT. The results of the association between perceived similarity and increased feelings vulnerability to death as a result of killing suggest that killing bugs may act in a way to bring concerns about an individual’s mortality into their mind (i.e. make their mortality salient). If this is the case then from a TMT perspective it might be expected that worldview and self esteem defence
may be found after an act of killing. If future research identified this then it would have important implications to a variety of violent situations by suggesting that the act of killing can exacerbate whatever kinds of ideological differences already exist between groups, further prejudice and increase violence.

The results of this study may also tie in well with a growing body of research on a special case of PTSD that is caused by an act of killing, Perpetration Induced Stress (PITS). PITS research suggests that those who commit an act of killing or violence often report greater severity of symptoms and psychological harm than other sufferers of PTSD (Green, 1990). Proponents of PITS suggest that the difference between PITS and PTSD stems from the unique psychological impact of killing another human being (MacNair, 2002). The present study may help provide information to understand what psychological aspects are affected by the perpetration of killing. Specifically, that engaging in an act of killing can increase a person’s feelings of vulnerability towards facing that same fate. Further, this study suggests the importance of the perpetrator’s perceived similarity to who they are killing. This could assist army psychologists in identifying soldiers who are at a higher risk of suffering from perpetration induced stress as well as provide information to help in the treatment of soldiers suffering from this.
4.5 Conclusion

This study has attempted to provide insight and explanation. It has identified that vulnerability to death can be provoked on an explicit and implicit level through an act of killing. However, this effect is contingent on the individual expressing a high level of perceived similarity with what they are killing. These findings are consistent with Lifton’s theorising, previous research using the bug killing paradigm and the emerging literature on the relationship between killing and PTSD. Lifton’s theory that increased feelings of vulnerability to death would lead to more killing has not been convincingly established by this study, however the results provide an avenue for further research into this suggesting that the act of killing may itself present a psychological hurdle that needs to be overcome before Lifton’s theory can take effect. The study has identified a number of areas for future research to both flesh out some of the preliminary findings of this study and explore other avenues of research to further examine the role of fear of death in the psychological impact of killing. One of the aspects to be taken away from this study is that the psychological variables involved with killing are complex and a multifaceted approach is important in understanding such a unique psychological act.

However, this study does provide empirical support for the provocation of vulnerability to death by an act of killing and outlines the circumstances in which this might occur. The growing interest in killing as a unique motivator of PTSD and the consistency of this study’s findings with other research literature suggests that a theoretically based, empirically supported understanding of the role of feelings of vulnerability to death in the act of killing is both an important and promising area of
research. Such research has implications on a wider scale. In a recent interview Robert Lifton had this to say about the nature of humanity:

There’s no inherent human nature that requires us to kill or maim. We can go either way. We have the potential for precisely that behavior of the Nazis or of what we did in Vietnam, or of some kind of more altruistic or cooperative behavior. We can go either way (Goodman, 2006).

By understanding the psychology behind an act of killing it may be possible to develop measures to mitigate the severity of a conflict or even prevent such conflict from occurring. If human beings truly can go ‘either way’ when faced with the opportunity to be destructive then research in this area may help to ensure that when faced with the choice we go the right way (Goodman, 2006).
References


Cambridge; New York: Cambridge University Press.


Appendices

Appendix 1: Information Sheet

Information Sheet: Roles and Personality.
University of Canterbury Psychology Department.

You are invited to participate as a subject in the above-titled research project. The aim of this project is to investigate human-animal interactions and the various roles involved with these interactions. More specifically, we are investigating the role of exterminators who work with bugs.

If you agree to participate, you may be asked to: (1) engage in a bug-extermination task; (2) read a description of the bugs; (3) fill out attitude questionnaires. The study will take place between 30-50 minutes. You are free to withdraw from the study at any time and will still receive credit for your participation.

The results of this study may be published, but you may be assured of the complete confidentiality of the data gathered in this investigation: the identity of participants will not be made public. To ensure confidentiality, your name will be separated from your responses in the study and your data will be kept in secure storage for a period of up to six years and then deleted when no longer required. Further, the data will be accessed only by the experimenter and their supervisor, Dr Andy Martens. If you have any questions or concerns about this study please contact Saul Gibney at 021 418 233, or at smg87@student.canterbury.ac.nz.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee.
Appendix 2: Consent Form

CONSENT FORM: ROLES AND PERSONALITY

I have read and understood the description of the above-titled project. I agree to participate as a participant in the project and I consent to the publication of the results of the project with the understanding that confidentiality will be preserved.

I understand that I may withdraw at any time from the project, including withdrawal of any information I have provided.

Name (please print):

Signature:

Date:
Appendix 3: The Multidimensional Fear of Death Scale

Multidimensional Fear of Death Scale

Instructions: Listed below are death-related events and circumstances that some people find to be fear-evoking. Indicate the extent to which you agree or disagree with each statement by circling one number for each item. Do not skip any items if you can avoid it.

1 = Strongly Agree
2 = Mildly Agree
3 = Neither Agree or Disagree
4 = Mildly Disagree
5 = Strongly Disagree

1 2 3 4 5 1.) I am afraid of dying very slowly.
1 2 3 4 5 2.) I dread visiting a funeral home.
1 2 3 4 5 3.) I am afraid that there is no afterlife.
1 2 3 4 5 4.) There are probably many people pronounced dead that are really still alive.
1 2 3 4 5 5.) I have a fear of not accomplishing my goals in my life before dying.
1 2 3 4 5 6.) I am afraid of meeting my creator.
1 2 3 4 5 7.) I dread the thought of my body being embalmed some day
1 2 3 4 5 8.) I am afraid of being buried alive.
1 2 3 4 5 9.) I am afraid of dying in a fire.
1 2 3 4 5 10.) Touching a corpse would not bother me.
1 2 3 4 5 11.) I am afraid that death is the end of one’s existence.
1 2 3 4 5 12.) People should have autopsies to ensure they are dead.
1 2 3 4 5 13.) I am afraid that I will not have time to experience everything that I want to do.
1 2 3 4 5 14.) I am afraid of experiencing a great deal of pain when I die.
1 2 3 4 5 15.) Discovering a dead body would be a horrifying experience.
1 2 3 4 5 16.) I would be afraid to walk in a graveyard alone at night.
1 2 3 4 5 17.) I am afraid of dying from cancer.
18.) It scares me to think I may be conscious while lying in a morgue.
19.) I am afraid that there may not be a Supreme Being.
20.) I have a fear of suffocating (including drowning).
21.) It would bother me to remove a dead animal from the road.
22.) I sometimes get upset when acquaintances die.
23.) No one can say, for sure, what happens after death.
24.) If I die my friends would be upset for a long time.
25.) I hope more than one doctor examines me to pronounce me dead.
26.) I am afraid of things which have died.
27.) I am afraid that I may never see my children grow up.
28.) I have a fear of dying violently.
29.) I believe in a personal God (a being capable of hearing and answering prayers).
Appendix 4: The Vulnerability Questionnaire

This is for a pilot study that we plan to run in the future. Please respond to these questions as honestly as you can so that we can determine which items to use in the future. Don't take too much time with any particular question, just go with your gut response, how you feel right now. Thank you for your honesty.

1. What are your chances of having your car stolen within the next 10 years compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

2. What are your chances of winning a free vacation within the next 10 years compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

3. What are your chances of getting the flu this year compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

4. What are your chances of meeting someone interesting who you become friends with in the next month compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

5. What are your chances of having your home or apartment burglarized within the next five years, compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

6. What are your chances of getting excellent grades next semester compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

7. What are your chances of being hurt in a car accident in the next 10 years compared with an average person your age?

   1 2 3 4 5 6 7 8 9
   Much lower chance than average
   Much higher chance than average

8. What are your chances of developing skin cancer in the next 10 years compared with an average person your age?
1. Much lower chance than average

2. Much higher chance than average

9. What are your chances of becoming fulfilled in life compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average

10. What are your chances of getting a kidney infection in the next 10 years compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average

11. What are your chances of suffering from food poisoning in the next 5 years compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average

12. What are your chances of living a long healthy life compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average

13. What are your chances of getting fired from a job compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average

14. What are your chances of having a nervous breakdown compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average

15. What are your chances of losing your wallet in the next year compared with an average person your age?

1. Much lower chance than average

2. Much higher chance than average
Appendix 5: The Re-Consent Form

RE-CONSENT FORM: ROLES AND PERSONALITY

The true nature of the research study has been explained to me and I will allow the use of my data for the purposes of this research. I consent to the publication of the results of the project with the understanding that confidentiality will be preserved.

Name (please print)

Signature

Date
Appendix 6: The Initial Questionnaire

Canterbury Psychology Study: Initial Questionnaire

Please indicate the degree to which each item describes you by choosing the appropriate point on the scale below.

\[ \begin{array}{cccccc}
0 & 1 & 2 & 3 & 4 \\
\text{(does not describe me well)} & \text{(describes me very well)}
\end{array} \]

1. ___ I daydream and fantasize, with some regularity, about things that might happen to me.
2. ___ I often have tender, concerned feelings for people less fortunate than me.
3. ___ I sometimes find it difficult to see things from the “other guys” point of view.
4. ___ Sometimes I don’t feel very sorry for other people when they are having problems.
5. ___ I really get involved with the feelings of the characters in a novel.
6. ___ In emergency situations, I feel apprehensive and ill-at-ease.
7. ___ I am usually objective when I watch a movie or play, and I don’t often get completely caught up in it.
8. ___ I try to look at everybody’s side of a disagreement before I make a decision.
9. ___ When I see someone being taken advantage of, I feel kind of protective towards them.
10. ___ I sometimes feel helpless when I am in the middle of a very emotional situation.
11. ___ I sometimes try to understand my friends better by imagining how things look from their perspective.
12. ___ Becoming extremely involved in a good book or movie is somewhat rare for me.
13. ___ When I see someone get hurt, I tend to remain calm.
14. ___ Other people’s misfortunes do not usually disturb me a great deal.
15. ___ If I’m sure I’m right about something, I don’t waste much time listening to other people’s arguments.
16. ___ After seeing a play or a movie, I have felt as though I were one of the characters.
17. ___ Being in a tense emotional situation scares me.
18. ___ When I see someone being treated unfairly, I sometimes don’t feel very much pity for them.
19. ___ I am usually pretty effective in dealing with emergencies.
20. ___ I am often quite touched by things that I see happen.
21. ___ I believe that there are two sides to every question and try to look at them both.
22. ___ I would describe myself as a pretty soft-hearted person.
23. ___ When I watch a good movie, I can very easily put myself in the place of a leading character.
24. ___ I tend to lose control during emergencies.
25. ___ When I’m upset at someone I usually try to “put myself in his/her shoes” for a while.
26. ___ When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.
27. ___ When I see someone who badly needs help in an emergency, I go to pieces.
28. ___ Before criticizing somebody, I try to imagining how I would feel if I were in their place.
29. ___ I find the thought of killing bugs concerning.
30. ___ I can see a number of similarities between humans and bugs.
Appendix 7: The Personality Questionnaire

**Canterbury Psychology Study: Personality Questionnaire**

Please use the following scale and record your answers in the spaces provided.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very much</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

**Part 1: Personality Assessment**

1. __ How afraid of your own death are you?
2. __ How much does your own death concern you?
3. __ How in touch with your own mortality are you?
4. __ How vulnerable to death do you feel?
5. __ During the practice extermination procedure, I felt what was happening didn’t seem real, like I was in a dream or watching a movie.
6. __ During the practice extermination procedure, I felt in an altered state of mind.
7. __ During the practice extermination procedure, I was “blanking out” or “spacing out” or in some way felt I was not part of what was going on.
8. __ During the extermination procedure I did not feel like my usual self.
9. __ What are your chances of getting the flu this year compared with an average person your age?
10. __ What are your chances of being hurt in a car accident in the next 10 years compared with an average person your age?
11. __ What are your chances of developing skin cancer in the next 10 years compared with an average person your age?
12. __ How vulnerable do you feel right now?
Appendix 8: GNAT Fruit-Good Association


Below you will see two categories of words. Read through these carefully to become familiar with each word. Following these words you will see a test list. When the researcher says go please go through the list and tick when you see a word from either category appear in the list. As you will be timed please go through the list as fast and as accurately as possible Do not tick any words that do not appear in the following categories.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Fruit</th>
<th>Good</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>apple</td>
<td>cheerful</td>
</tr>
<tr>
<td></td>
<td>orange</td>
<td>joyful</td>
</tr>
<tr>
<td></td>
<td>plum</td>
<td>terrific</td>
</tr>
</tbody>
</table>

When you are ready, let the experimenter know and wait for them to give you the instruction to begin.

| orange     | 0         | terrible  | 0         |
| angry      | 0         | angry     | 0         |
| apple      | 0         | joyful    | 0         |
| terrific   | 0         | plum      | 0         |
| plum       | 0         | angry     | 0         |
| joyful     | 0         | orange    | 0         |
| terrible   | 0         | horrible  | 0         |
| cheerful   | 0         | cheerful  | 0         |
| horrible   | 0         | apple     | 0         |
| terrible   | 0         | angry     | 0         |
| cheerful   | 0         | terrible  | 0         |
| horrible   | 0         | cheerful  | 0         |
| terrible   | 0         | horrible  | 0         |
| angry      | 0         | cheerful  | 0         |
| apple      | 0         | terrible  | 0         |
| cheerful   | 0         | horrible  | 0         |
| horrible   | 0         | cheerful  | 0         |
| terrible   | 0         | terrible  | 0         |
| orange     | 0         | joyful    | 0         |
| angry      | 0         | plum      | 0         |
| plum       | 0         | terrific  | 0         |
| joyful     | 0         | apple     | 0         |
| angry      | 0         | angry     | 0         |
| terrible   | 0         | orange    | 0         |
Appendix 9: GNAT Fruit-Bad Association

**Psychometric Word Reaction Task VERSION 1: Part 2.**

Below you will see two categories of words. Read through these carefully to become familiar with each word. Following these words you will see a test list. You will have 45 seconds to go through the list *as fast and as accurately as possible* and tick when you see a word from either category appear in the list. Do **not** tick any words that do **not** appear in the following categories.

<table>
<thead>
<tr>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit</strong></td>
</tr>
<tr>
<td>apple</td>
</tr>
<tr>
<td>orange</td>
</tr>
<tr>
<td>plum</td>
</tr>
<tr>
<td><strong>Bad</strong></td>
</tr>
<tr>
<td>angry</td>
</tr>
<tr>
<td>horrible</td>
</tr>
<tr>
<td>terrible</td>
</tr>
</tbody>
</table>

When you are ready, let the experimenter know and wait for them to give you the instruction to begin.

| orange      |   O  |
| cheerfull   |   O  |
| apple       |   O  |
| terrible    |   O  |
| plum        |   O  |
| horrible    |   O  |
| cheerfull   |   O  |
| angry       |   O  |
| joyful      |   O  |
| cheerfull   |   O  |
| apple       |   O  |
| cheerful    |   O  |
| angry       |   O  |
| joyful      |   O  |
| cheerfull   |   O  |
| apple       |   O  |
| cheerful    |   O  |
| angry       |   O  |
| terrific    |   O  |
| orange      |   O  |
| cheerfull   |   O  |
| apple       |   O  |
| cheerful    |   O  |
| angry       |   O  |
| joyful      |   O  |
| cheerfull   |   O  |
| apple       |   O  |
| cheerful    |   O  |
| angry       |   O  |
| terrific    |   O  |
| orange      |   O  |
| cheerfull   |   O  |
| apple       |   O  |
| cheerful    |   O  |
| angry       |   O  |
| terrific    |   O  |
| orange      |   O  |
Appendix 10: GNAT Self-Life Association

**Psychometric Word Reaction Task VERSION 2: Part 2.**

Below you will see two categories of words. Read through these carefully to become familiar with each word. Following these words you will see a test list. You will have 45 seconds to go through the list as fast and as accurately as possible and tick when you see a word from either category appear in the list. Leave blank any words that do not appear in the following categories.

### Categories

<table>
<thead>
<tr>
<th>Self</th>
<th>Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>me</td>
<td>life</td>
</tr>
<tr>
<td>mine</td>
<td>live</td>
</tr>
<tr>
<td>my</td>
<td>living</td>
</tr>
</tbody>
</table>

When you are ready, let the experimenter know and wait for them to give you the instruction to begin.

<table>
<thead>
<tr>
<th>mine</th>
<th>O</th>
<th>life</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>living</td>
<td>O</td>
<td>death</td>
<td>O</td>
</tr>
<tr>
<td>me</td>
<td>O</td>
<td>die</td>
<td>O</td>
</tr>
<tr>
<td>dying</td>
<td>O</td>
<td>my</td>
<td>O</td>
</tr>
<tr>
<td>my</td>
<td>O</td>
<td>dying</td>
<td>O</td>
</tr>
<tr>
<td>die</td>
<td>O</td>
<td>mine</td>
<td>O</td>
</tr>
<tr>
<td>die</td>
<td>O</td>
<td>live</td>
<td>O</td>
</tr>
<tr>
<td>death</td>
<td>O</td>
<td>dying</td>
<td>O</td>
</tr>
<tr>
<td>dying</td>
<td>O</td>
<td>death</td>
<td>O</td>
</tr>
<tr>
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<tr>
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<td>living</td>
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</tr>
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<td>die</td>
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<tr>
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<td>me</td>
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<tr>
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</tr>
<tr>
<td>death</td>
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<td>O</td>
</tr>
<tr>
<td>life</td>
<td>O</td>
<td>my</td>
<td>O</td>
</tr>
</tbody>
</table>
Appendix 11: GNAT Self-Death Association


Below you will see two categories of words. Read through these carefully to become familiar with each word. Following these words you will see a test list. You will have 45 seconds to go through the list as fast and as accurately as possible and tick when you see a word from either category appear in the list. Do not tick any words that do not appear in the following categories.

**Categories**

<table>
<thead>
<tr>
<th>Self</th>
<th>Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>me</td>
<td>death</td>
</tr>
<tr>
<td>mine</td>
<td>die</td>
</tr>
<tr>
<td>my</td>
<td>dying</td>
</tr>
</tbody>
</table>

When you are ready, let the experimenter know and wait for them to give you the instruction to begin.

<table>
<thead>
<tr>
<th>mine</th>
<th>O</th>
<th>life</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>living</td>
<td>O</td>
<td>living</td>
<td>O</td>
</tr>
<tr>
<td>me</td>
<td>O</td>
<td>die</td>
<td>O</td>
</tr>
<tr>
<td>dying</td>
<td>O</td>
<td>my</td>
<td>O</td>
</tr>
<tr>
<td>my</td>
<td>O</td>
<td>living</td>
<td>O</td>
</tr>
<tr>
<td>die</td>
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</tr>
<tr>
<td>life</td>
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<td>live</td>
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</tr>
<tr>
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<td>death</td>
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</tr>
<tr>
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<tr>
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</table>