Order Number 9408194

Death anxiety in young adults in relation to the perceived threat of nuclear war

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California School of Professional Psychology - Fresno, 1993

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DEATH ANXIETY IN YOUNG ADULTS IN RELATION TO THE PERCEIVED THREAT OF NUCLEAR WAR

BY

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A dissertation submitted
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in Psychology
California School of Professional Psychology
Fresno Campus
1993

CALIFORNIA SCHOOL OF PROFESSIONAL PSYCHOLOGY

FRESNO CAMPUS

The dissertation of Peter David Liggett, "Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War," approved by his Committee, has been accepted and approved by the Faculty of the California School of Professional Psychology, Fresno Campus, in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Psychology.

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DEDICATION

In dedication to my loving wife, Tiffeny.

ACKNOWLEDGMENTS

It is difficult to find words that express my gratitude for the individuals who aided me in completing this project. Merle Canfield was an excellent chairperson who offered leadership when it was needed, but allowed me to feel like I was in charge of my study. I would like to thank Dorothy Spencer for her guidance and encouragement in completing this study--she has been a true mentor. David McMurray inspired me many years ago to pursue this study. His ability to communicate his ideas while leaving room for new perspectives led me to ask him to participate as a committee member. I thank him for the excitement and energy he offered me at every step.

Several close friends lent me support through the years and gave me additional strength to finish when I did. Joe Foggiato has been a tireless and true friend from the moment I stepped onto a college campus, and he continues to be there for me even though we live far from one another. Tom Blansett has been a mentor, a colleague, and above all, a friend for many years. He has offered me guidance through many of the storms he weathered as a student. He and his wife Pat have been important people in this journey. Last, and definitely not least, Aaron and Nancy Townsend have made the same journey as I have, and they have offered support

throughout the process. Aaron was directly involved in this project as my "stats man." I wish you both luck and clear sailing.

Jim and Connie Edwards, my father- and mother-in-law, have brought me into their family as if it was where I had always belonged. They have helped to make South Carolina our home, and they have encouraged me through this process with love and parental support.

Finally, I would like to thank my parents, David and Jacqueline Liggett, for their love, support, and friendship. Through their guidance and commitment, I have learned what it means to be proud of what you do. To them, I wish a life on The Bay with clear skies and wind in their sails.

ABSTRACT OF THE DISSERTATION

Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War

by

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1993

The present study was designed to investigate the relationship between young adults' (age = 18 to 22) perception of the threat of nuclear cataclysm, or nuclear anxiety, and their levels of death anxiety. College students (N = 317) were asked to complete the Nuclear Attitudes Questionnaire (Newcomb, 1986) and the Death Anxiety Scale (Templer, 1970). The four subscale scores of the NAQ--Nuclear Concern, Fear of the Future, Nuclear Support, and Nuclear Denial--were paired with the DAS score for purposes of computing Pearson product-moment correlation coefficients. A multiple regression computation was run as a secondary analysis

All four of the paired scores showed significant correlations. The NAQ's Nuclear Concern subscale showed the strongest correlation with the DAS score (r = .50,

$p < .001$), and Fear of the Future scores also correlated significantly with DAS scores ($r = .33$, $p < .001$). Significant negative correlations were obtained between Nuclear Support scores and DAS scores ($r = -.17$, $p < .01$) and Nuclear Denial scores and DAS scores ($r = -.39$, $p < .001$). There were no significant differences between gender groups (males, $n = 137$; females, $n = 180$). There was one significant difference between Caucasian Americans and African Americans with regard to correlations for the Nuclear Denial/DAS pairs.

Results of this study indicate that there is a strong correlational relationship between individuals' level of nuclear anxiety and their level of death anxiety. While a causal relationship was not established, these results strengthen the argument that a high level of anxiety regarding nuclear cataclysm lends itself to a young adult's inability to envision a future.

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Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War

Two years following the conclusion of World War II, a study was conducted by Purdue University which found that among 10,000 high school students, almost one half believed the United States would fight in another war within 5 years (Remmers, Gage, Hobson, & Shimberg, 1947). The same study found that two thirds believed the U.S. would participate in a war in the next 25 years. Fifteen years later, a group of studies were done (e.g., Adams, 1963; Allerhand, 1965; Darr, 1963; Escalona, 1965; Schwebel, 1965) that assessed the awareness and beliefs of adolescents and nuclear war. These studies, which were prompted by the Berlin Wall and Cuban Missile Crises (Chivian et al., 1985), found that most of the respondents spontaneously referred to nuclear weapons and war (Allerhand, 1965; Escalona, 1965), and almost one half believed a war possible or likely (Adams, 1963; Schwebel, 1965) (see Appendix A for extended literature review).

> Studies conducted in the early 1960s, when many of these thresholds to nuclear war were reached, indicated that children and adolescents were quite distressed and personally affected by these world events. These individuals felt that they had the most to lose in the event of nuclear war because they would be denied a chance to live, to love, to work, to bear children and raise a family. (Newcomb, 1988b, p. 108)

Living under the shadow of the threat of nuclear war compromises people's safety and possibly spells the end of their existence; the threat of nuclear holocaust and the possibility of an untimely death must be faced (Newcomb, 1988b). People reside in an ever-changing world with regard to the use of nuclear technology. With the dismantling of what used to be the Soviet Union and the unification of East and West Germany, many believed that the end of the cold war equalled the end of the threat of a nuclear holocaust. However, a veritable free market of nuclear technology and materials is now available to individuals and countries who wish to assemble them to create a bomb. Countries such as North Korea, Pakistan, India, Algeria, and Israel have been able to pursue nuclear weapons programs while not being held to the standards of nonproliferation treaties. Furthermore, while under the close scrutiny of the United Nations, Iraq has continued to pursue the covert creation of a nuclear weapons program (Budiansky, 1992).

Many believe the world now feels safer; however, the importance of living within the context that society possesses the capability of annihilating its own species remains. The awareness of this threat lies in the unconscious and pulls away vital energy from day-to-day living (McMurray, 1993). While there seems to be a lull in the threat of nuclear war, the following sentiment demonstrates the continued seriousness of this issue:

> Even though we are technically at peace, or at least not involved in acknowledged overt warfare, there may be an emotional and social cost to the fragile balance of nuclear proliferation. The quality and meaning of our lives may be affected by the threat and real potential of a nuclear war. (Newcomb, 1988b, p. 108)

The problem addressed in this study was the relationship between nuclear anxiety and the concept of death anxiety. If a relationship does exist between fear of nuclear war and anxiety surrounding one's own death, then mental health practitioners and researchers can begin to examine the manifestations of these correlated conditions.

There has been a wide variety of research approaches to the topic of nuclear war, including anecdotal or qualitative studies and survey research, as well as quantitative research, which implements more rigid statistical designs. In the realm of anecdotal or qualitative research focusing on young adulthood, there are a number of areas that have been explored in depth with regard to nuclear war. They include the family's role in the young adult's perception of the threat of nuclear war (Greenwald & Zeitlin, 1987), his or her sense of self-efficacy (e.g., Loeb, 1988), and ongoing observations of the young adult's reaction to the threat (e.g., McMurray, 1988). Newcomb (1991) reported that this type of exploration into the effect of the nuclear threat has indicated that living in a world compromised by nuclear technology may adversely affect

emotional well-being, increase anxiety, and influence psychosocial development.

The purpose of this study was to address a specific area of cognitive development in young adults: their perception of their future and the cognitive and emotional effects of this perception on them. More specifically, this study looked at young adults' fear of death, as measured by Templer's Death Anxiety Scale (1970), in relation to their perception of the dangerousness of nuclear weapons and power, as measured by Newcomb's Nuclear Attitudes Questionnaire 1986).

Among the factors that confound the development of an outlook is the adolescent's and young adult's perception of self-efficacy or control over the environment in which he or she exists (e.g., Sampson, 1988). In the past 30 years or so, technological development has accelerated to the point that individuals have lost the ability to fully utilize and understand new technologies. As a generation, control has been lost of the harmful effects of today's technologies, so that the quality of people's lives, and indeed, their very existence, is threatened (McMurray, 1988). The possibility of the destruction of the earth leaves young adults unsure about what they can control in their environment.

Lester and Becker (1993) examined differences in attitudes toward death among college-aged students today compared to students surveyed by Middleton in 1935

(Middleton, 1936). The study indicated that students today show much greater concern and anxiety over death than did students in 1935. More specifically, students today are more likely to think about dying in accidents or from specific diseases, dream about dying or being dead more often, are made more depressed and anxious by death, and have a stronger fear of death.

In a study of American college students' attitudes and responses toward death in the 20th century, Fulton and Owen (1988) concluded that significant changes have occurred during that period of time. Furthermore, they concluded that the threat of nuclear war and life in the nuclear age are the centerpieces of the increase in anxiety about death. And, while life expectancy has increased and early-age death has dramatically decreased, current generations face "the threat of sudden anonymous death that is counterpoised against a more immediate experience with death that often is either distorted or denied" (p. 392).

A number of studies have been conducted using questionnaires or surveys with children and adolescents through the age of 19. These studies addressed fear of nuclear war and fears surrounding the possibility of nuclear war (e.g., Beardslee & Mack, 1982; Blackwell & Gessner, 1983; Goldberg et al., 1985; Goldenring & Doctor, 1984; Holmborg & Bergstrom, 1984; Solantaus, Rimpela, & Rahkonen, 1985). With regard to college-aged respondents, Mayton and

Delamater (1986) found that of 127 college students who expressed concern about their futures using incomplete sentences, 18% spontaneously mentioned nuclear war directly.

The 1980s saw a group of individuals attempt to measure and assess nuclear concerns, attitudes, and fears through the use of psychometric instruments whose data were analyzed in more systematic and statistically sound ways (Mayton, 1988; Newcomb, 1988a). These instruments were designed to measure cognitive and emotional positions (Hamilton, Chavez, & Keilin, 1986), degree of activism (Werner & Roy, 1985), knowledge and opinion (Kierulff & Zippin, 1985; Mayton, 1984; Nelson, 1985), spontaneous concerns about nuclear war (Mayton, 1986), and nuclear anxiety (Newcomb, 1986).

Using the Nuclear Attitudes Questionnaire (NAQ), Newcomb (1986) found that nuclear anxiety was significantly associated with less purpose in life, less satisfaction, more powerlessness, more depression, and more drug use. Newcomb further concluded that nuclear anxiety is significantly related to psychological distress and may disturb normal development. Further research conducted by Newcomb (1988a, 1988b), using the NAQ, found that nuclear anxiety was significantly correlated with less social conformity, fewer social resources, more drug problems, more psychosomatic complaints, more emotional distress, and more health problems.

The present study addressed the level of death anxiety in young adults as a consequence of fear of the threat of a nuclear war or cataclysm happening in their lifetime. It was hypothesized that a high level of concern regarding the possibility of nuclear cataclysm would correlate with a high level of general death anxiety. Results of an instrument that measures death anxiety were statistically related to results of a measurement of nuclear anxiety.

The importance of statistically establishing the relationship between young adults' fear of nuclear war and their fear of death may lend itself to affirming the results of decades of interview and anecdotal research. This research indicates that youth today are preoccupied with the fear that their lives may be brought to an end by a tip in the fragile balance of the scales of nuclear proliferation.

Method

Subjects

The Nuclear Attitudes Questionnaire (NAQ) (Newcomb, 1986) was administered in conjunction with the Death Anxiety Scale (DAS) (Templer, 1969) to 317 college students. These subjects were obtained in introductory courses at the University of South Carolina, Columbia, during the spring semester of 1993. Only those subjects aged 18 to 22 were used in computing the results; the mean age was 19.51. The sample included 137 males and 180 females, with 220

responding as Caucasian Americans, 77 as African Americans, 1 Native American, 6 Asian Americans, 1 Hispanic American, 8 international students, and 4 responded as "Other." This information was used for purposes of discriminating specific group trends and their responses (see Table 1 for description of sample; see Appendix B for extended methodology).

Measures

The NAQ was presented first, followed by the DAS. Titles of the instruments were omitted (see Appendix C for sample instruments). Attached to the front of the two instruments was an informed consent statement (Appendix D) and questions regarding demographics. The students were not given any specific information regarding the purpose of the study until after they had completed the instruments. A debriefing statement was made once the information had been collected, and any questions the respondents had regarding the study were answered.

The NAQ is divided into four multi-item subscales which are delineated to reflect a latent construct of nuclear anxiety (Mayton, 1988; Newcomb, 1988a, 1988b). These subscales include Nuclear Concern, Nuclear Support, Fear for the Future, and Nuclear Denial, and are comprised of selected questions from the 15-item NAQ. The 15 items of the NAQ are presented in a Likert format and are scored 1 to 5, 1 meaning that the subject strongly disagrees with the

Table 1

Description of Sample

	N	%
Number sampled	317	100.0
Sex		
Male	137	43.2
Female	180	56.8
Age		
Mean Age = 19.51		
Range = 18-22		
Ethnicity		
Caucasian American	220	69.4
African American	77	24.3
Native American	1	.3
Asian American	6	2.0
Hispanic American	1	.3
International	8	2.5
Other	4	1.3
Home state		
South Carolina	245	77.3
Virginia	8	2.5
Georgia	8	2.5
New Jersey	8	2.5
North Carolina	6	2.0
Maryland	5	1.6
New York	4	1.3
Ohio	3	.9
Texas	3	.9
West Virginia	2	.6
Tennessee	2	.6
Massachusetts	2	.6
Wisconsin	2	.6
Florida	2	.6
Rhode Island	2	.6
Connecticut	2	.6
Vermont	1	.3
Illinois	1	.3
Louisiana	1	.3
California	1	.3
Nebraska	1	.3

Table 1 (continued)

	N	%
Pennsylvania	1	.3
Wyoming	1	.3
New Hampshire	1	.3
North Dakota	1	.3
Colorado	1	.9
Foreign student	3	.9

statement and 5 indicating that the subject strongly agrees with the statement (Mayton, 1988). Scores are compiled by adding the numeric values circled by the respondent within a given subscale. Two of the items (7 and 15) are reverse scored and are given reverse value. Item 7, a Nuclear Denial item, states that there is a strong link between nuclear power and war. Individuals disagreeing with this item deny the link between nuclear weapons and power plants as having similar potential for causing nuclear cataclysm (Newcomb, 1986). Item 15 from the Fear for the Future scale states that the individual has no hesitancy about raising a child with the treat of nuclear war. Strong disagreement supports this item as indicating the individual fears for the future and is given reverse value.

The Death Anxiety Scale (DAS) consists of 15 true-false statements regarding death. Some of the items are scored in the false direction and some in the true direction. The sum of the questions answered in the scored direction yields a raw DAS score (range = 0 to 15).

Hypotheses

The specific hypotheses that guided this study were as follows.

Hypothesis 1. Levels of Nuclear Concern will positively correlate with levels of death anxiety.

Hypothesis 2. Levels of Fear for the Future will positively correlate with levels of death anxiety.

Hypothesis 3. Higher levels of Nuclear Support will negatively correlate with levels of death anxiety.

Hypothesis 4. Higher levels of Nuclear Denial will negatively correlate with levels of death anxiety.

Hypothesis 5. Multiple regression analysis will show a positive relationship between the latent construct of nuclear anxiety and death anxiety.

Results

DAS scores were summed and the four NAQ subscale scores were compiled. The individual DAS scores were paired with the four NAQ subscale scores, and the Pearson product-moment correlation coefficients were calculated for the four pairs. A multiple regression was run as a secondary analysis to determine the relationship between the four NAQ variables as a whole and the DAS score. The four NAQ subscale items served as the X_1 variables and the DAS scores as the X_2 variable (see Table 2). Three of the four pairs showed statistical significance at the $p < .001$ confidence level, while the fourth was significant at the $p < .01$ confidence level.

The NAQ's Nuclear Concern subscale showed the strongest correlation with Templer's Death Anxiety Scale score

Table 2

Correlation Matrix--Overall Sample

	Nuclear Concern	Fear of Future	Nuclear Support	Nuclear Denial	Death Anxiety
Nuclear Concern		.54**	-.44**	-.56**	.50**
Fear of Future	.54**		-.30**	-.37**	.33**
Nuclear Support	-.44**	-.30**		.47**	-.17*
Nuclear Denial	-.56**	-.37**	.47**		-.39**
Death Anxiety	.50**	.33**	-.17*	-.39**	

Note. N = 317

*p < .01, **p < .001

($r = .50$, $p < .001$), and Fear of the Future scores also correlated significantly with DAS scores ($r = .33$, $p < .001$). Significant negative correlations were obtained between Nuclear Support scores and DAS scores ($r = -.17$, $p < .01$) and Nuclear Denial scores and DAS scores ($r = -.39$, $p < .001$).

A stepwise method of multiple regression was performed using the subjects' DAS scores as the dependent variable (see Table 3). Analysis of the data was somewhat different from the correlational analysis. Nuclear Concern was the first best predictor, $F(1, 316) = 106.31$, $p < .05$. However, Nuclear Denial was the second strongest, $F(2, 315) = 58.07$, $p < .05$, and Nuclear Support was the third and final predictor, $F(3, 314) = 40.63$, $p < .05$. Fear of the Future failed to make a significant contribution when grouped with the other variables. However, at the univariate level, Fear of the Future was significant, $F(4, 313) = 30.97$, $p < .05$.

Using the four pairs of variables for correlational analysis (Concern/Anxiety, Future/Anxiety, Support/Anxiety, and Denial/Anxiety), gender differences were analyzed. There were no significant differences between the two groups as far as correlative data were concerned (see Table 4). Furthermore, by utilizing the Fisher r-to-z transformation, pairs were compared between samples. Group z scores were tested to determine whether each was significantly different (positive or negative) from zero by examining whether the

Table 3

Multiple Regression Matrix--Overall Sample

	Death Anxiety	
	df	F
Nuclear Concern	1, 316	106.31*
Nuclear Support	2, 315	58.07*
Nuclear Denial	3, 315	40.63*

*p < .05

Table 4

Correlations Between NAQ Scales and DAS Males and Females

	Death Anxiety		
	Males (n = 137)	Females (n = 180)	Fisher's z-test difference
Nuclear Concern	.49**	.44**	.56
Fear of Future	.30**	.24**	.57
Nuclear Support	-.14	-.17	-.27
Nuclear Denial	-.46**	-.35**	-1.15

*p < .01, **p < .001

group score was significant at the .05 level ($z_a > |1.96|$). Again, correlation values were not significantly different between the groups. However, by breaking down the sample size, Fear of Future and Death Anxiety correlation coefficients failed to be significant at the $p < .01$ confidence level for both gender groups.

Correlations for the two main ethnic groups--Caucasian Americans and African Americans--were calculated (see Table 5). The remaining groups (Native Americans, Asian Americans, Hispanic Americans, international students, and "Other"; total n = 20) were too small in size for any meaningful statistical analysis. There were some notable differences between the two groups with regard to statistical significance. The Caucasian American group (n = 220) showed statistical significance in the four correlated pairs, which was consistent with the results of the overall group (Concern/Anxiety: $r = .52$, $p < .001$; Future/Anxiety: $r = .29$, $p < .001$; Support/Anxiety: $r = -.21$, $p < .01$; Denial/Anxiety: $r = -.51$, $p < .001$). The African American group (n = 77) only demonstrated a significant relationship between the Nuclear Concern and DAS pair ($r = -.40$, $p < .001$). The remaining three pairs (Future/Anxiety, Support/Anxiety, and Denial/Anxiety) failed to reach the significance level at the minimum $p < .01$ confidence level. Again, by utilizing the Fisher r-to-z transformation, the pairs were compared between samples (see

Table 5). Those data indicated that the Nuclear Concern/DAS ($z = 1.13$, $p < .05$), Fear of the Future/DAS ($z = .40$, $p < .05$), and the Nuclear Support/DAS ($z = -1.06$, $p < .05$) did not differ significantly. In other words, despite the fact that certain correlations were significant in one group and not the other, the correlations themselves were not significantly different. However, the Nuclear Denial/DAS pair did show a significant difference ($z = -2.75$, $p < .05$) in correlations between the Caucasian American group and the African American group.

Discussion

The hypothesized relationship between the four Nuclear Attitudes Questionnaire subscales and the Death Anxiety Scale were all statistically significant. Using Pearson's product-moment correlational analysis, three of the relationships were quite robust; the fourth was mildly significant.

Nuclear Concern and Death Anxiety

The strongest relationship was demonstrated between the Nuclear Concern subscale scores and DAS scores using both Pearson correlational analysis and multiple regression analysis. This was the case for the overall sample as well as the different gender groups and American Caucasian and African American groups. This indicates that there is a strong relationship between young adults' fear and

Table 5

Correlations Between NAQ Scales and DAS Caucasian Americans and African Americans

	Death Anxiety		
	Caucasian Americans (n = 220)	African Americans (n = 77)	Fisher's z-test difference
Nuclear Concern	.52**	.40**	1.13
Fear of Future	.29**	.24	.40
Nuclear Support	-.21*	-.07	-1.06
Nuclear Denial	-.51**	-.19	-2.75+

*p < .01, **p < .001, +p > 1.96

apprehension regarding nuclear war and power plants and their anxiety toward death.

Fear for the Future and Death Anxiety

A Pearson product-moment correlational analysis indicated a strong significant relationship appears to exist between young adults' Fear of the Future and Death Anxiety. However, multiple regression analysis failed to include this variable as a predictor until a forced entry method isolated it for univariate significance. While the strength of this relationship remained for the group of Caucasian Americans, the smaller size of the African American group was unable to sustain this significance.

Nuclear Support and Death Anxiety

Individuals' Death Anxiety levels appear to be significantly related to the degree to which they believe in the use and safety of nuclear power plants and the need for nuclear weapons. This is an inverse relationship as hypothesized. That is, an individual's death anxiety increases as his or her level of support for nuclear power and weapons decreases.

This was a stronger relationship for the Caucasian American group than the group as a whole. It was not a significant relationship for the African American group; again, this may be due to the smaller size of the group.

Nuclear Denial and Death Anxiety

A strong inverse relationship was demonstrated between Nuclear Denial and Death Anxiety. This would indicate that individuals who demonstrate a belief in being capable of surviving a nuclear war, a belief that others overreact to the threat, and a lack of worry about nuclear war will report lower levels of death anxiety. Again, this relationship was significant for the overall sample and the Caucasian American group, but not for the African American group.

Nuclear Anxiety and Death Anxiety

Multiple regression analysis of the four NAQ items taken as a group and correlated with DAS scores strongly supported the hypothesis that nuclear anxiety is correlated with death anxiety. Three of the NAQ items, Nuclear Concern, Nuclear Support, and Nuclear Denial, lent themselves as a group to being strong predictors of death anxiety. Fear of the Future's contribution was not significant, however.

Conclusions

Results of this study indicate that there is a strong correlational relationship between individuals' level of nuclear anxiety and their level of death anxiety. While a causal relationship was not established, these results

strengthen the argument that a high level of anxiety regarding nuclear cataclysm lends itself to a young adult's inability to envision a future. An individual who is preoccupied by the thought of a nuclear holocaust or a nuclear power plant disaster will ultimately be preoccupied by fears of death.

Researchers who wrote about the perils of living in the nuclear age (e.g., Fiske, 1992; Lifton, 1992; Macy, 1992; McMurray, 1993) indicated that it is through education and understanding that fears, apprehensions, and anxieties are conquered about living in a world with such destructive capabilities. Without an understanding, one fears learning and knowing more and proceeds with a numbness that blocks out any thought of actions that may prevent the ultimate extinction of everything one holds dear.

> We have come to recognize, through research studies, that there is a lot of anxiety about nuclear weapons. But that anxiety is useful, at least the tension and fear, because it's a break from the sustained numbing that prevails from nuclear normality. (Lifton, 1992, p. 26)

Suggestions for Further Research

Greenwald and Zeitlin (1987) stated that the end of the threat of nuclear war must begin within one's own family. Open discussion regarding feelings and fears about living in a world that does not seem safe at times is the key to ending the isolation and numbing experienced when faced with unknowns.

> Research confirms that inter-generational communication about these matters has a positive impact on development. What research also reveals, sadly, is that only a small minority of adolescents communicate with adults about their concerns. It was this discrepancy, the sense that the nuclear issue was still taboo, which motivated our (Greenwald & Zeitlin, 1987) work on family communication. (Zeitlin, 1992, p. 388)

The present study affirms the relationship between young adults' fear of death and their fear of nuclear cataclysm. There seem to be indications that young adults have left home without having experienced the familial communication which empowers them to respond to the threat actively rather than react passively. Research into the family's role in the empowerment of young adults might prove useful.

The differences that appeared between ethnic groups was noteworthy. Further research on young adults with different ethnic backgrounds with regard to nuclear anxiety seems to be indicated. A larger sample of individuals from differing ethnic backgrounds may better demonstrate a relationship between nuclear anxiety and death anxiety. However, it is conceivable that death anxiety has a stronger relationship with other external factors for different ethnic groups.

A study which compares age groups with regard to nuclear anxiety and death anxiety may lend itself to a developmental model for these two experiences. With regard to nuclear anxiety, do individuals experience an increase in "psychic numbing" (Lifton, 1982) as they grow older?

Lonetto and Templer (1986) indicated that there appears to be no significant relationship between reported death anxiety and age. However, nuclear anxiety levels have not been given the same scrutiny. A longitudinal study looking at the levels of these two types of specific anxiety may reveal useful data regarding changes in nuclear anxiety and death anxiety over time.

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APPENDICES

APPENDIX A

EXTENDED LITERATURE REVIEW AND REFERENCES

Extended Literature Review

In all the time it has taken humankind to evolve to its current state, never has its destiny been in such question. At dawn on August 6, 1945, a new sun rose in the small town of Hiroshima, Japan, which marked the genesis of a new era whereby humankind possessed the power to annihilate itself. Surely, physicists around the world were not prepared to fathom the extent to which the evolution of nuclear physics would lead to its self-disdain.

> Twentieth-century physics, quite aside from nuclear energy and nuclear weapons, is a great adventure of human imagination and intelligence, and until 1939 it was carried on quite outside the world of politics. It was "pure" science--a matter of the contest of the human mind with nature; the object was not to change the world, but to understand it. (Bundy, 1988, p. 4)

However, the result was a change in the world, and this sentiment seems illustrative of the way the world would grow to understand the importance of nuclear weapons and power.

Historical Perspective and Context

The decision made to proceed with an attempt to harness the energy of the atom and channel it into a weapon was made by President Franklin D. Roosevelt on October 9, 1941. It was a decision made seemingly without much thought, but one that would affect the course of history.

> In October 1941 it was natural to the point of inevitability that Roosevelt should decide that Hitler must not be first. So much, indeed, he had decided already. . . FDR had been persuaded to do what little he did by the argument that we must

> not let the other fellow blow us up. The plausibility of that threat had been multiplied in the meantime by a still unbroken string of sharp and overwhelmingly successful Nazi surprises. (Bundy, 1988, p. 48)

Fortunately, Adolf Hitler was only mildly interested in the development and usage of nuclear technology primarily because the topic was beyond Hitler's understanding of science and nuclear physics, which he often referred to as "Jewish physics." The topic was broached once in one of Hitler's thousands of staff meetings and was met with no response from Hitler (Speer, 1970). And, although Nazi Germany eventually faded as a legitimate enemy, the understanding of nuclear power and weaponry would soon be shared by the world. The Soviet Union and the United States of America would enter into a race that could not be won.

Helen Caldicott, a pediatrician who has studied the carcinogenic and mutagenic effects of radiation, indicated that since the advent of the atomic bomb, the U.S. has been close to using nuclear weapons numerous times. As early as 1948, the U.S. considered tactical nuclear weapons as a response to the Communist emergence in Eastern Europe. Caldicott outlined seven other significant events and included the entire Vietnam War as situations in which nuclear weapons were seriously considered as a viable option (Caldicott, 1986).

Early Studies of the Response to the Nuclear Threat

Remmers, Gage, Hobson, and Shimberg (1947) conducted a study 2 years following the conclusion of World War II in which they surveyed 10,000 high school students across the country. Their results indicated that almost one half of those surveyed believed the U.S. would fight in another war within 5 years. Furthermore, two thirds believed the U.S. would participate in a war in the next 25 years.

During a 15-year period following World War II, a group of studies, which were prompted by the Berlin Wall and Cuban Missile Crises (Chivian et al., 1985), were conducted (e.g., Adams, 1963; Allerhand, 1965; Darr, 1963; Escalona, 1965; Schwebel, 1965) which assessed adolescents' beliefs and awareness of the threat of nuclear war. These studies found that most of the respondents spontaneously referred to nuclear weapons and war (Allerhand, 1965; Escalona, 1965), and almost one half believed a war possible or likely (Adams, 1963; Schwebel, 1965).

> Time and again in response to questions about nuclear conflict, (children) said--and they said it bitterly--that they would pay the biggest price. They would lose, they felt, the largest portion of their lives, and they would miss the opportunity to enjoy the pleasures they had hardly even begun to taste. (Schwebel, 1982, pp. 608-609)

Chivian et al. (1985) stated that a period of latency occurred from the time of these studies in the early 1960s through 1977, when a task force was formed to address the

psychosocial aspects of nuclear developments. Beardslee and Mack (1982) found that of a group of adolescents (15 to 18 years old) surveyed in a study conducted by the task force, more than 50% in the sample thought that a nuclear war was possible, and a "substantial minority" thought it likely.

The historical nuclear occurrence outlined by Caldicott (1986), coupled with the Three Mile Island Nuclear Power Plant accident; a television production titled "The Day After, which depicted the aftermath of nuclear war in a small, mid-Western town; and the meltdown and explosion of the Soviet nuclear power plant in Chernobyl, seemed to bring the fear of an actual nuclear war or serious nuclear accident to a pinnacle.

Current Geo-Political Atmosphere

On the evening of October 4, 1991, President George Bush addressed the U.S. in what was promoted as an historical step toward nuclear disarmament.

> Bush's speech Friday evening offered not a promise of a brave new nuclear-free world but a complicated mix of ideas old and new, and unilateral actions and proposals for fresh negotiations with Moscow. And, in those negotiations, the U.S. opening position to some extent will continue the old game of "Let's get rid of the mainstays of your nuclear arsenal, but not of ours." (Church, 1991, p. 21)

In short, Bush's proposal was to unilaterally eliminate land-based, short-range missiles or "tactical nukes"; single warhead, intercontinental ballistic missiles (ICBMs); naval

cruise missiles carrying nuclear warheads; and a negotiated number of multiple warhead ICBMs (Church, 1991). Not coincidentally, this proposal sought to reduce the main threat posed by the U.S.S.R., while maintaining the nuclear advantage of the U.S. This was accomplished by targeting those weapons which are least effective from the U.S. standpoint (land-based ICBMs) and leaving intact the U.S. advantages, which includes submarine launched ballistic missiles (SLBMs) (Talbott, 1991).

Latest figures (Hoffman, 1992) show that the United States contains in its arsenal 1,000 ICBMs; 640 SLBMs; and 383 bomber weapons, with a total of 19,000 individual warheads. Similarly, the former Soviet states, which used to make up the U.S.S.R., possess 1,418 ICBMs; 928 SLBMs; and 325 bomber weapons, for a total of 27,300 nuclear warheads. On July 31, 1991, President Bush and then Soviet President Gorbachev signed the Strategic Arms Reduction Treaty (START), eliminating some ICBM warheads. Once START is ratified by both sides, the total number of warheads will drop a mere 10% for both arsenals, and limitations will be made on increasing the number of warheads in other areas (Hoffman, 1993).

Caldicott (1986) commented on the incredible destructive potential of the world's arsenals saying, "To promote the cause of 'strength' in the nuclear age by arguing for more bombs is a classic example of pre-nuclear

thinking. Before 1945, it was true that the more conventional weapons the country possessed, the safer it was" (p. 229).

Theoretical Perspective

With the dismantling of what used to be the Soviet Union and the unification of East and West Germany, the world appears to be a complex and ever-changing system with regard to the use of nuclear technology. Many believed that the end of the cold war equalled the quieting of the threat of nuclear holocaust. However, nuclear technology and materials are now available to individuals and countries such as North Korea, Pakistan, India, Algeria, and Israel, who have been able to pursue nuclear weapons programs while not being held to the standards of nonproliferation treaties. Even under the close scrutiny of the United Nations, Iraq has continued to pursue the covert creation of a nuclear weapons program (Budiansky, 1992). Ullmann (1993) reported that renewed anxieties emerged over the nuclear stores that exist in Russia, which are at the disposal of whomever gains control over the Russian government.

Despite world political developments, the importance of living within the context that society possesses the capability of annihilating its own species remains. The awareness of the nuclear threat lies in the unconscious and pulls away vital energy from day-to-day living (McMurray, 1993). Lifton (1982) stated that the use of nuclear weapons

on two Japanese cities gave substance to the image of nuclear extinction and disseminated it everywhere, making it the psychic property of humankind.

The discussion of the threat of nuclear war seems to be experiencing a lull, and there is every indication that technically peace prevails throughout the world. However, Newcomb (1988b) indicated that there may be emotional and social costs to individuals in light of the fragile balance of nuclear proliferation. There may be serious effects on the quality and meaning of one's life by the threat and real potential of a nuclear war.

Context of the Problem

The approaches to studying the effects of living with the threat of nuclear war have varied greatly. Anecdotal or qualitative studies and survey research have dominated the examination of this topic (Newcomb, 1991), but more recently quantitative research has grown in this area. This research has implemented more rigid statistical designs.

The anecdotal or qualitative research focusing on young adulthood has addressed a wide range of areas with regard to nuclear war. This research has included examinations into the family's role in young adults' perception of the threat of nuclear war (Greenwald & Zeitlin, 1987), young adults' sense of self-efficacy in a world threatened by nuclear war (e.g., Loeb, 1988), and ongoing observations of the young adults' reaction to that threat (e.g., McMurray, 1988). The

purpose of this study was to address a specific area of cognitive development in young adults--that of the young adults' perception of their future and the cognitive and emotional effects of this perception on them. More specifically, this study looked at the young adults' fear of death in relation to their perception of the dangerousness of nuclear weapons and power.

Young adults' outlooks are important to giving them a framework or guideline for the development of visions and ambitions. They are in a transitional period after being forced out of childhood and thrust into maturity. Identity development is a key resolution for any young adult (Baller & Charles, 1968). However, much of the research (including Bernikow, 1986; McMurray, 1993; Weiss, 1985) indicated that without the development of an outlook, the resolution of finding an identity can be difficult, leaving the young adult with a sense of emotional detachment or isolation, loss, and separation. These features, according to Lonetto and Templer (1986), all factor in as components of death anxiety.

The Nuclear War Threat and Death Anxiety

Lester and Becker (1993) examined differences in attitudes toward death among college-aged students. Lester replicated a study conducted by Middleton (1936) by administering a questionnaire regarding attitudes toward

death to 634 students, with ages ranging from 19 to 25 (mean age = 20.8, standard deviation = 1.5), who were enrolled in college classes. The study indicated that students today show much greater concern and anxiety over death than did students in 1935. More specifically, students today are more likely to think about dying in accidents or from specific diseases, dream about dying or being dead more often, are made more depressed and anxious by death, and have a stronger fear of death.

What is at the core of this increase in death anxiety? Fulton and Owen (1988) studied American attitudes and responses toward death in the 20th century and also found that significant changes have occurred during that period of time. They examined the different experience and conceptualization of death for pre- and post-nuclear-age generations. Their appraisal of the change that has occurred indicated that post-World War II generations experience death as an abstract and distant concept. Furthermore, while life expectancy has increased and early-age death has dramatically decreased, current generations face "the threat of sudden anonymous death that is counterpoised against a more immediate experience with death that often is either distorted or denied" (p. 392). The prevalence of death images in mass media presentation leads to this distortion and/or denial by making death fantastical fiction and simultaneously real and explicit.

> A key aspect that distinguishes the two generations is the nuclear bomb and the view taken toward the role that this unique weapon promises to play in human history. That is, the older generation saw the bomb as helping to bring to an abrupt end the terrible conflict of World War II. For the younger generation the bomb is not so much a symbol of peace and stability among nations as it is a threat--not only to humankind in general but also as an insurmountable barrier to the future. (Fulton & Owen, 1988, p. 382)

Lifton (1992) discussed his conceptualization of the need for a larger sense of human connectedness, or what he called the sense of immortality. This immortality is the sense that individuals require a sense of living on in their children and their children's children, in a group and country, and also the sense that a part of them lives on in humankind. The threat of nuclear war brings with it a genocidal mentality or an individual and collective willingness to destroy. This mentality puts into question the sense of immortality by threatening not only individuals but their ability to live on in the species as a whole.

It appears that individuals' level of worry about the threat of nuclear war is not pervasively high. However, the same individuals believe it is a strong possibility, and they tend to report quite bleak beliefs about a nuclear holocaust. They produce horrific images and give low estimates of personal survival (Fiske, 1992). "If one combines people's estimated probability of nuclear war and their estimated probability of dying if a nuclear war occurred, people are essentially saying that they have about

one chance in three of dying from a nuclear attack" (Fiske, 1992, p. 311).

Macy (1992) looked at the effects of the threat of nuclear war, society's relationship with the global community, and its concerns about the destruction of its environment. Her examination of people's response to the nuclear threat and other global problems indicated that a great deal of anxiety is experienced with regard to the actions taken (and not taken), negative feelings experienced, and the results of raising negative emotions in others.

> Our awareness of (the threat of nuclear war) is so potent and pervasive that, according to polls, the majority of the public expects nuclear war to occur within their lifetimes, that they will not survive it, and that civilization as we know it will end. (Macy, 1992, p. 31)

Fulton and Owen (1988) indicated that there is a clear need for more research regarding the manner in which this generation of American youth and young adults view themselves in a world that has now seen the development of a neutron bomb.

Young Adults Living in the Nuclear Age

Adolescents' and young adults' perception of diminished self-efficacy or control over the environment in which they exist appears to confound the development of an outlook (e.g., Sampson, 1988). During the last 30 years, technological development has accelerated to the point that

individuals have lost the understanding and abilities required to utilize their new technologies. As a generation, control of the harmful effects of the products of these technological advances have been lost, so that the quality of lives and existence are threatened (McMurray, 1988). The possibility of the destruction of the earth leaves the young adult unsure about what he or she can control in his or her environment.

> Nuclear weapons are simply the destructive edge of our technology gone wild in its distorted blend with science--or what Lewis Mumford calls the final apotheosis of the contemporary mega-machine. But the weapons remain at the heart of our fear as the most extreme expression of that aberration. (Lifton, 1982, pp. 60-61)

McMurray (1988) has long studied the effects of the current state of today's technologies and environment on youth's outlook. This interest compelled him to gather data concerning the issues brought to the counseling center at Humboldt State University and examine the attitudes of the campus population in general. He concluded that, although the 1960s and 1970s saw a growth in teenage activism--those fighting for a cause, whether it be the Vietnam War or Watergate--this trend has, to a large extent, discontinued in today's young adult. Emotionally speaking, today's youth, especially adolescents and young adults, have a dim view of the world. They have a hopeless outlook, feeing that they are helpless and unable to make any changes.

> The nuclear anxiety-terror-fear has now generalized to include a wide variety of environmental issues, that are often right beneath the surface of awareness. . . (The) combined problem of hopelessness, radical futurelessness, and a lack of a sense of meaning is affecting all youth, and especially our most creative and brightest young. It is affecting the energies that lead to the creative thrust of mankind. (McMurray, 1993, p. 2)

Loeb (1988) visited more than 100 colleges and found that college students seem to think they have the power to achieve six-figure salaries, but believe they do not have the power to affect the arms race or poverty. Nearly half of them believed atomic war to be a reasonable likelihood within the course of their lives. But only a handful thought their actions could help prevent this. Loeb commented on those who might be termed activists within the groups he studied: "Some argue that among today's young adults there exists a revisiting of the activist; this, however, is participation in cultural nostalgia, not political engagement" (p. 62). The contradiction Loeb saw in college students' attitudes seemed to indicate that, although today's adolescents and young adults feel powerless when it comes to world events, they need to feel control over something. So they focus on what they can control. "In order to deal with the anxiety . . . in a land, they feel, whose leaders and even adults don't care, they resort to different forms of accommodation. One of them is immediate gratification. If there is no tomorrow, they say, let me live for today" (Schwebel, 1982, p. 611).

Interviews with teenagers and young adults have yielded important information about stressors that influence their views. The types of events and stressors are different and more diverse from those experienced by previous generations. Greenwald and Zeitlin (1987) placed a life-span template, using Eriksonian stage development, upon the topic of the nuclear age. Their exploration of adolescent views on nuclear war yielded comments from adolescents of all age groups. Their comments support McMurray's conclusions about the adolescent's and young adult's outlook. Most of the comments Greenwald and Zeitlin received included some sort of doubt as to whether they would have a future:

> Leslie Thomas, 17, is asked how her awareness of nuclear issues may impact on her thoughts or plans about the future. She responds, "I sometimes wonder if I'm going to have one. Am I going to be able to finish college? Am I going to get married? Am I going to have kids? Am I going to live to grow old and sit in a rocking chair on my front porch? I don't know. Sometimes these things cross my mind. And I don't like the idea of them not happening. (p. 97)

Goodman et al. (1983) interviewed 31 adolescents aged 14 to 19 regarding the threat of nuclear war. This study found that most expressed an intense sense of helplessness, futurelessness, fear and terror, and individual powerlessness. They expect death to be the fate they will encounter long before they have lived an entire lifetime.

If interviews yield this type of information, a number of research questions arise: If the threat of nuclear war produces anxiety in young adults, is the level of death

anxiety concurrently increased, and how can the effects of this fear be measured? The idea of the possibility of nuclear holocaust and its effects on the young adult's outlook, emotional state, and sense of control is intriguing. One must ask another poignant question: If young adults feel they have no control over the environment as a whole, then how are they able to control individual stimuli?

Previous Attempts to Measure

Within the scope of research regarding life in the nuclear age, numerous studies have been conducted using questionnaires or surveys, but the bulk of these studies have included adolescents and in some cases children. The highest age included in this group of studies was 19 years. The number of studies that measure young adults' anxieties regarding nuclear war are few.

Descriptive studies. Beardslee and Mack (1982) surveyed 1,150 adolescents aged 11 to 18, using a questionnaire regarding nuclear issues. The researchers found that a majority of those surveyed thought a nuclear war was possible. Furthermore, they found the existence of an uneasiness about the future and about the presence of nuclear weapons and nuclear power. They also found uncertainty and fear about nuclear war.

Blackwell and Gessner (1983) used a seven-item questionnaire designed to assess attitudes about nuclear arms and the threat of nuclear war in terms of their effect on the students' lives present and future. Out of a sample of 1,500 adolescents aged 15, 83% were greatly or moderately fearful of nuclear war, and 82% believed that the probability of nuclear war was great to moderate.

Goldberg et al. (1985) conducted a study in which two open-ended questions were asked, one of which was, "What three things do you most worry about?" The most frequently mentioned fear of two samples of adolescent students (N = 2,137) was the threat of nuclear war. Furthermore, Goldberg et al. found a significant positive correlation between those who mentioned nuclear war as their number one fear and their level of generalized anxiety.

Surveys regarding fear of nuclear war found that fear or worry about nuclear war was quite high. Goldenring and Doctor (1984) found that 58% of their 913 respondents worried about nuclear war; Holmborg and Bergstrom (1984) found that 42% of the 917 students they surveyed labeled nuclear war as their greatest worry; and Chivian, Mack, and Waletsky (1983) found that of 293 adolescents they surveyed, 98.6% were worried about nuclear war. Solantaus, Rimpela, and Rahkonen (1985), found that in Finland, the threat of nuclear war was the most common source of fear among their youth (77% for boys; 84% for girls). With regard to

college-aged respondents, Mayton and Delamater (1986) found that of 127 college students who expressed concern about their future, using incomplete sentences, 18% spontaneously mentioned nuclear war directly.

Quantitative studies. The 1980s saw a group of individuals put forth attempts at measuring and assessing nuclear concerns, attitudes, and fears through the use of psychometric instruments whose data were analyzed in systematic and statistically sound ways (Mayton, 1988; Newcomb, 1988a). This group of instruments have been designed to measure cognitive and emotional positions (Hamilton, Chavez, & Keilin, 1986), degree of activism (Werner & Roy, 1985), knowledge and opinion (Kierulff & Zippin, 1985; Mayton, 1984; Nelson, 1985), spontaneous concerns about nuclear war (Mayton, 1986), and nuclear anxiety (Newcomb, 1986).

Hamilton, Knox, and Keilin (1986) studied 214 families' response to the threat of nuclear war. Using the Nuclear War Questionnaire--a 16-item Likert-type instrument--they found that families high in socioeconomic status were more worried about nuclear war, more confident in their ability to help reduce the nuclear threat, and more supportive of proposals for arms reduction. However, groups did not differ on several other important measures such as overall life impact resulting from the nuclear threat.

Attempting to measure activism with regard to the nuclear arms race, Werner and Roy (1985) developed a 14-item Likert-format questionnaire. They administered their instrument to 227 individuals, which made up five groups: peace activists (n = 51), religious teachers (n = 51), graduate students in psychology (n = 45), Republican party members (n = 42), and workers in defense industries (n = 38). Their findings indicated that the nuclear activism questionnaire they had developed had good internal consistency and was able to distinguish among groups differing in their orientation toward the issue of the nuclear arms race.

Within the context of introducing education on the nuclear threat into college courses, Nelson and Slem (1984) developed and utilized the 20-item Nuclear Weapons Policies Questionnaire (NWPQ). The NWPQ contains items grouped within subscales which have been labeled: Arms Control Opinion, Concern About Superiority, Soviet Arms Control Intentions, Strategic Defense Initiative, War Probability, War Effects, War Worry, and Freeze if Inferior. Mayton (1988) reported strong test-retest reliability and indicated that the instrument demonstrated the significant effects that classroom lectures on the topics of arms control and the threat of nuclear war have on nuclear war attitudes.

A cross-national comparison of methods of nuclear war measurement was conducted by Mayton (1990) with the

collaboration of individuals from the United Kingdom, New Zealand, and Japan. College students were sampled from two campuses in the U.S., one in the United Kingdom, and one campus in Japan. The New Zealand sample consisted of 61 physicians. The study employed the Modified World Affairs Questionnaire (NAQ) (Newcomb, 1986) and the Brief Measure of Activism Regarding the Nuclear Arms Race (BMARAR) (Werner & Roy, 1985) as measures for each sample. Results indicated that there were no significant differences between groups with regard to belief that a nuclear war is probable and worry about that probability, concern about the nuclear threat, and of fear of the future. The values of those results indicated that individuals from the five samples are concerned about the nuclear threat, believe nuclear war is a probability, worry moderately about that probability, but do not fear for the future. Higher NAQ Nuclear Concern scores were strongly related across all but the New Zealand sample to beliefs that a global nuclear war would be devastating. Finally, Mayton found consistency across the five groups with regard to the relationship between nuclear attitude and activist behaviors. More specifically, antinuclear behaviors were directly related to higher levels of nuclear concern, worry about the nuclear threat, fear of the future, and beliefs that the outcome of a global nuclear war would be more devastating.

Rabow, Hernandez, and Newcomb (1990) completed a cross-national study of fears and concerns among college students. Individuals ranging in age from 18 to 24 (mean age = 21.44) made up three sample groups from the U.S. (n = 108), Great Britain (n = 111), and Sweden (n = 69). The study employed the Nuclear Attitudes Questionnaire and an incomplete sentences form. Results of this study indicated that college students in the three nations tend to have similar attitudes toward nuclear issues, strong nuclear anxiety, little nuclear support, slight fear of the future, and do not deny the possible threat of a nuclear disaster. There were some differences among the three groups with regard to the degree of the similarities. For instance, Swedish students appeared less concerned and had less fear of the future than did the American and British students. British students indicated the least amount of support for nuclear weaponry and energy. Gender differences indicated that women (n = 150) expressed more concern, less support for nuclear weaponry and energy, more fear of the future, less nuclear denial, and more nuclear anxiety.

Using the same group of students as Rabow et al. (1990), Newcomb, Rabow, and Hernandez (1992) completed a cross-national study of nuclear attitudes, normative support, and activist behavior. The study concluded that few differences existed among the three groups with regard to concern about nuclear war, antinuclear attitudes, the

extent of antinuclear activities, and support for antiwar activities. Sex differences did emerge. Women reported greater concern about war in general and expressed more antinuclear sentiment than did men.

Nuclear Anxiety

Schwebel (1982) began using the term "nuclear anxiety" when he studied the effects of the nuclear war threat on children and teenagers. His use of the term related to the fear individuals experience in relation to the threat of nuclear war, nuclear power plant accidents, or any sort of nuclear cataclysm.

Newcomb (1986) developed the Nuclear Attitudes Questionnaire (NAQ) to measure nuclear anxiety. The NAQ is divided into four multi-item subscales which are delineated to reflect a latent construct of nuclear anxiety (Mayton, 1988; Newcomb, 1988b). These subscales include Nuclear Concern, Nuclear Support, Fear for the Future, and Nuclear Denial, and are comprised of selected questions from the 15-item NAQ.

Newcomb (1986) found that these scales were highly correlated and were found to reflect a second-order factor of nuclear anxiety, as used in this study.

> I hoped that the scales underlying the 15 NAQ items might reflect a second-order factor of nuclear anxiety. This hypothesis is based on the notion expressed by previous researchers that the threat of nuclear atrocity is a pervasive and insidious worry that may permeate many areas of a person's life in a general way. (Newcomb, 1986, p. 907)

Using the Nuclear Attitudes Questionnaire, Newcomb (1986) found that nuclear anxiety was significantly associated with less purpose in life, less satisfaction, more powerlessness, more depression, and more drug use. Newcomb further concluded that nuclear anxiety is significantly related to psychological distress and may disturb normal development. Further research conducted by Newcomb (1988a, 1988b), using the Nuclear Attitudes Questionnaire, found that nuclear anxiety was significantly correlated with less social conformity, fewer social resources, more drug problems, more psychosomatic complaints, more emotional distress, and more health problems.

> Although this [sic] data cannot determine whether nuclear anxiety generated these problems, it can be concluded that concern about nuclear issues is differentially related to various areas of life functioning over and above the confounding influences of social conformity and interpersonal connectedness. (Newcomb, 1988b, p. 107)

The Nuclear Concern scale of the NAQ consists of five items related to fear, apprehension, and anxiety regarding nuclear war, nuclear weapons, and nuclear power plants (Newcomb, 1986, 1988a, 1988b). The Fear for the Future scale includes two items. One assesses the respondent's belief in the likelihood of nuclear war within 10 years, and the other item addresses worry about raising children in a world threatened by nuclear war (Newcomb, 1986, 1988a, 1988b). The Nuclear Denial scale consists of four items

that reflect belief in surviving a nuclear war, overreaction to the threat of nuclear war, and lack of worry about nuclear war. These items are designed to assess an individual's denial in the belief that nuclear weapons and power are inherently dangerous (Newcomb, 1986, 1988a, 1988b). The Nuclear Support scale includes four items that reflect belief in the use and safety of nuclear power plants and the need for nuclear weapons (Newcomb, 1986, 1988a, 1988b). "Fear for the Future and Nuclear Concern assess aspects of increased nuclear anxiety, whereas Nuclear Denial and Nuclear Support assess reduced nuclear anxiety and belief in the need for nuclear proliferation and nuclear power" (Newcomb, 1988a, p. 595).

Death Anxiety

The construct of death anxiety has been described in a number of different ways. However, McMordie (1978) concluded, after reviewing 24 scales which attempted to measure anxiety about death, that the most often cited definition in the assessment literature has been Templer's (1970) description of an unpleasant emotional state precipitated by contemplation of one's own death.

Lonetto and Templer (1986) further elucidated the construct of death anxiety, stating that this concept is not a unitary idea, but rather it consists of several components, which they outlined:

> 1) Concern about both the cognitive and emotional impact of dying and death; 2) Anticipation and fear of the physical alteration brought about by dying and death; 3) Awareness of the finite time between birth and death and of the rapidity of its passage; and, 4) Concern about the stress and pain accompanying illness, disease, and dying. (p. 4)

It has been indicated by a number of studies, according to Lonetto and Templer (1986), that the four components mentioned above represent sources of death anxiety. Furthermore, each of the components individually or in combination with one another determines the level and relationship of death anxiety to a variety of different variables. Suggestions for future research indicate a need for identification of those components of death anxiety that are differentially influenced by internal and external factors (Lonetto & Templer, 1986). Marshall (1982) indicated that among the numerous scales and instruments which measure death anxiety, there exists no consensus as to what level of fear is "normal" or "pathological."

Lonetto and Templer (1986) surveyed literature regarding differences in age and sex in relationship with death anxiety. They indicated that there appears to be no significant relationship between DAS scores and age for any group studied. However, they did state that there are differences between males and females. Females demonstrated a greater degree of expressed death anxiety and higher scores on the DAS. They added, however, that females "have

tended to score higher on most self-report measures of anxiety, distress, and maladjustment" (p. 8).

Templer (1972) studied differences in death anxiety between white and black college-aged students. This study employed the Death Anxiety Scale (Templer, 1970) and included 134 blacks and 124 whites. Templer concluded that there were no significant differences between the two groups with regard to levels of death anxiety.

Hypotheses

This study addressed the level of death anxiety in young adults as associated with the fear, apprehension, and anxiety relative to the threat of a nuclear war, nuclear weapons, nuclear power plants, and the dangerous byproducts of nuclear technology. It was hypothesized that a high level of concern regarding the perils of nuclear weapons and power would correlate with a high level of general death anxiety. A measure of death anxiety was related to a measurement of nuclear anxiety.

The specific hypotheses which guided this study were outlined as follows:

Hypothesis 1. Levels of Nuclear Concern will positively correlate with levels of Death Anxiety.

Hypothesis 2. Levels of Fear for the Future will positively correlate with levels of Death Anxiety.

Hypothesis 3. Higher levels of nuclear support will negatively correlate with levels of death anxiety.

Hypothesis 4. Higher levels of nuclear denial will negatively correlate with levels of death anxiety.

Hypothesis 5. Multiple regression analysis will show a positive relationship between the latent construct of Nuclear Anxiety and Death Anxiety.

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APPENDIX B

EXTENDED METHODOLOGY

Subjects

The Nuclear Attitudes Questionnaire (NAQ) (Newcomb, 1986) was administered in conjunction with the Death Anxiety Scale (DAS) (Templer, 1969) to 317 introductory-level college students. These subjects were obtained in introductory courses at the University of South Carolina, Columbia, during the spring semester of 1993. Only those subjects aged 18 to 22 were used in computing the results.

The NAQ was presented first, followed by the DAS. Titles of the instruments were omitted. Attached to the front of the two instruments was an informed consent statement and questions regarding demographics. The students were not given any specific information regarding the purpose of the study until after they completed the instruments. A debriefing statement was made once the information had been collected, and any questions the respondents had regarding the study were answered.

Measures

This section examines the Nuclear Attitudes Questionnaire (Newcomb, 1986) and the Death Anxiety Scale (Templer, 1970). Issues of validity, reliability, and test structure are explored.

The Nuclear Attitudes Questionnaire

The NAQ is divided into four multi-item subscales which are delineated to reflect a latent construct of nuclear

anxiety (Mayton, 1988; Newcomb, 1988a, 1988b). These subscales include Nuclear Concern, Nuclear Support, Fear for the Future, and Nuclear Denial, and are comprised of selected questions from the 15-item NAQ. The NAQ's 15 items are presented in a Likert format and are scored 1 to 5--1 meaning that the subject strongly disagrees with the statement and 5 indicating that the subject strongly agrees with the statement (Mayton, 1988).

The Nuclear Concern scale consists of five items related to fear and apprehension regarding nuclear war and power plants. The Nuclear Support scale includes four items that reflect belief in the use and safety of nuclear power plants and the need for nuclear weapons. The Fear for the Future scale includes two items. One assesses the respondent's belief in the likelihood of nuclear war within 10 years, and the other item addresses worry about raising children in a world threatened by nuclear war. Finally, the Nuclear Denial scale consists of four items that reflect belief in surviving a nuclear war, overreaction to the threat of nuclear war, and lack of worry about nuclear war (Newcomb, 1986, 1988a, 1988b).

Newcomb found that these scales were highly correlated and reflected a second-order factor of Nuclear Anxiety, as used in this study. Eight-week test-retest reliability of the total scale was over .80 (Newcomb, 1987), and the convergent and discriminant validity with other measures was

quite good (Hamilton, 1987). "The NAQ has been utilized by Newcomb to provide limited correlational evidence that the threat of nuclear war may have a psychologically distressful impact on young adults--an impact that probably disturbs normal maturational development of some individuals" (Mayton, 1988, p. 245).

Mayton (1987) and Hamilton (1987) provided concurrent validity data relating the NAQ subscales on the Modified World Affairs Questionnaire and on other nuclear war attitude scales. "The NAQ clearly appears to be a psychometrically sound instrument" (Mayton, 1988, p. 245).

The Death Anxiety Scale

The Death Anxiety Scale (Templer, 1970) is an instrument that has been used in a multitude of studies regarding death anxiety (Lonetto & Templer, 1986). The Death Anxiety Scale (DAS) consists of 15 equally weighted true-false statements that address death, thoughts of death, disease, and time perspective (Marshall, 1982). Some of the items are scored in the false direction and some in the true direction. The sum of the questions answered in the scored direction yields a raw DAS score (range = 1 to 15).

Lonetto and Templer (1986) reported the DAS to have strong face validity and internal consistency. Relative to test-retest reliability, they reported a product-moment correlation of .83 ($p < .01$) and a coefficient of .76, with regard to internal consistency with the same individuals.

The DAS was also shown to have strong discriminant validity when correlated with instruments that measure general anxiety. The correlations were sufficiently insignificant, indicating that the instrument is not just another measure of general anxiety (Lonetto & Templer, 1986).

In summary, a variety of attempts to assess the validity of the DAS have suggested (a) that the construct measured by the index is related to, but independent of, general anxiety; (b) that it correlates with recognized measures of nonverbalized death anxiety and with one other well-established verbal measure, the Fear of Death Scale (Lester, 1966); and (c) that it can be meaningfully interpreted in terms of known groups (Marshall, 1982).

Marshall (1982) acknowledged the virtue of the DAS as an instrument that has been widely used and analyzed, but recommended further use of the instrument in research to determine correlates of death anxiety. This would aid in further elucidating the dimensions of death anxiety as measured by the DAS.

Analysis of Data

DAS scores were summed and NAQ subscale scores were compiled. The DAS scores were paired with the four NAQ subscale scores, and the correlation coefficients were calculated for the four pairs. A multiple regression was run as a secondary analysis.

Specific groups were analyzed with regard to correlations between the four pairs. Correlation coefficients were run for the two gender groups and the Caucasian American and African American groups. Fisher's z-r transformation was used to determine whether a significant difference in correlational values existed between males and females and between Caucasian Americans and African Americans.

APPENDIX C

SAMPLE INSTRUMENTS

APPENDIX D

INFORMED CONSENT FORM

UNIVERSITY OF SOUTH CAROLINA

COLUMBIA, S. C. 29208

COUNSELING AND HUMAN DEVELOPMENT CENTER

Division of Student Affairs

I N F O R M E D C O N S E N T F O R M

The attached surveys serve as instruments by which two related concepts will be assessed. The questions and statements relate to your attitudes about these concepts. The exact purpose and nature of the study will be explained to you following your completion of the instruments. Specific details are withheld simply to ensure that you are able to answer the questions without any preconceived notion as to their purpose.

By signing this form you are acknowledging your interest in participating in the study and your understanding of the following:

1. Your participation in this study is voluntary and not required.

2. These instruments are not intended to be intrusive or harmful. No procedures will be conducted which may cause harm to you.

3. Your participation will be kept confidential, and there will be no association made between you and specific responses to the two questionnaires.

4. You will not be compensated for your participation.

5. The results of this study will be made available upon your request.

I understand and voluntarily agree to all the above conditions. I also understand that I may direct any questions I have regarding the study to the investigator listed below. I also understand that I may contact the University of South Carolina Institutional Review Board listed below if at any time during this study I feel that my rights have been violated.

Name_____

Signature_____ Date_____

Thank you for your participation.

Investigator:
Peter Liggett, M.A.
Psychology Intern
Counseling Center
University of South Carolina

USC IRB:
Off. of Sponsored Prog. & Research
Room 506 Byrnes Building
Univ. of South Carolina
Columbia, S.C. 29208

APPENDIX E

PERMISSIONS FOR STUDY

Peter D. Liggett
1608 Enoree Avenue
Columbia, S.C. 29205
(803)779-3719 Home
(803)777-5223 Work

September 14, 1992

Michael D. Newcomb
Department of Psychology
University of California, Los Angeles
Los Angeles, California 90024-1563

Dear Dr. Newcomb:

I am currently working toward a doctoral degree in clinical psychology and am in the process of completing my doctoral dissertation. My dissertation is titled, "Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War," and employs Templer's Death Anxiety Scale, and your Nuclear Attitudes Questionnaire.

I would like your written permission to use and reprint the Nuclear Attitudes Questionnaire in my study, and would appreciate any unpublished reprints of studies you have completed using the NAQ.

If you have any questions regarding my study, I can be reached during the day at the University of South Carolina Counseling and Human Development Center (803-777-5223).

Thank you for your time, Dr. Newcomb.

Sincerely,

Pete Liggett

I give you permission to use my NAQ Scale—
Good luck w/ your research Michael Newcomb

Date:

Dear

Thank you for your letter of March 22, 1993 . You most certainly have my permission to use my Death Anxiety Scale (DAS). Since it is not on the commercial market, there is no payment for its use. Enclosed find a DAS form that I have used since 1970, and a couple of articles pertaining to DAS construction, validation, items, scoring, administration, and norm like information. One point is scored for each item answered in the keyed high death anxiety direction, so that a DAS score could be as low as 0 and as high as 15. A Likert format for the DAS is described by McMordie in Psychological Reports, 1979, 44, 975-980.

The book, Death Anxiety, by Richard Lonetto and Donald I. Templer (Hemisphere Publishing Corporation, Washington, 1986) reviews the correlates of death anxiety (age, sex, other demographic variables, parental resemblance, religion, personality, physical health, psychopathology, occupation, behavior, death of significant others), factor analyses, death imagery, intervention, the measurement of death anxiety, and Templer's two-factor theory of death anxiety.

Feel free to contact me for additional information or advice, including help in preparation of a manuscript for a journal article if your findings are sufficiently interesting.

Sincerely,

Donald Templer

Donald I. Templer, PhD

DIT:
Enclosures

THE UNIVERSITY OF SOUTH CAROLINA

Office of Sponsored Programs
and Research

Columbia, SC 29208
803-777-7093
FAX 803-777-4136

April 2, 1993

Dr. Peter Liggett
Department of Student Affairs

Re: Proposal entitled "Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War"
IRB Approval Date: 3/29/93

Dear Dr. Liggett:

Attached is a certification of approval for the use of human subjects involved in the study referenced above. Please forward the form to the appropriate funding agency if required, or retain it for your files.

Note, it is the responsibility of the principal investigator to report immediately any changes in procedures involving human subjects; and any unexpected risks to human subjects; any detrimental effects to the rights and welfare of any human subjects participating in the project, giving names of persons, date of occurrence, detail of harmful effects; and any remedial action.

Secondly, be advised that signed Informed Consent forms and/or other research related records (if applicable) are to be retained for at least three (3) years after termination of last IRB approval, and shall be accessible for purposes of audit.

Should your study terminate before you have received an annual review, please notify me or Arlene McWhorter for the final report form.

If you have questions concerning this, please call me at 7-7095.

Sincerely,

Thomas A. Coggins
IRB Administrator

TAC/am
Enclosure
cc: Dr. Franklyn Bolander, IRB Chairperson

Thomas A. Coggins

THE UNIVERSITY OF SOUTH CAROLINA

Office of Sponsored Programs
and Research

Columbia, SC 29208
803-777-7093
FAX 803-777-4136

March 26, 1993

INSTITUTIONAL REVIEW FOR THE USE OF HUMAN SUBJECTS IN RESEARCH

EXEMPT REVIEW FORM

Principal Investigator: Peter Liggett

Department: Student Affairs

Project Title: "Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War"

SPAR Proposal/Award Number:

Funding Agency: Self-Funded Doctoral Dissertation Project

Comments:

APPROVAL/EXEMPT REVIEW

I have reviewed the referenced proposal and I find that it meets the requirements for Exempt review and that it follows all of the Federal guidelines for research involving human subjects.

3/29/93
Signature of Reviewer/Date signed

PLEASE SEND FORM TO THE OFFICE OF SPONSORED PROGRAMS AND RESEARCH, ROOM 506 BYRNES INTERNATIONAL CENTER, USC.

am
rev. 7/87

MAR [illegible] 1993

OMB No. 0925-0637

DEPARTMENT OF HEALTH AND HUMAN SERVICES

PROTECTION OF HUMAN SUBJECTS ASSURANCE/CERTIFICATION/DECLARATION

☒ ORIGINAL ☐ FOLLOWUP ☐ EXEMPTION (previously undesignated)

☒ GRANT ☐ CONTRACT ☐ FELLOW ☐ OTHER

☒ New ☐ Competing continuation ☐ Noncompeting continuation ☐ Supplemental

APPLICATION IDENTIFICATION NO. *(if known)*

POLICY: A research activity involving human subjects that is not exempt from HHS regulations may not be funded unless an Institutional Review Board (IRB) has reviewed and approved the activity in accordance with Section 474 of the Public Health Service Act as implemented by Title 45, Part 46 of the Code of Federal Regulations (45 CFR 46—as revised). The applicant institution must submit certification of IRB approval to HHS unless the applicant institution has designated a specific exemption under Section 46.101(b) which applies to the proposed research activity. Institutions with an assurance of compliance on file with HHS which covers the proposed activity should submit certification of IRB review and approval with each application. (In exceptional cases, certification may be accepted up to 60 days after the receipt date for which the application is submitted.) In the case of institutions which do not have an assurance of compliance on file with HHS covering the proposed activity, certification of IRB review and approval must be submitted within 30 days of the receipt of a written request from HHS for certification.

1. TITLE OF APPLICATION OR ACTIVITY

"Death Anxiety in Young Adults in Relation to the Perceived Threat of Nuclear War"

2. PRINCIPAL INVESTIGATOR, PROGRAM DIRECTOR, OR FELLOW

Peter Liggett

3. FOOD AND DRUG ADMINISTRATION REQUIRED INFORMATION *(see reverse side)*

4. HHS ASSURANCE STATUS

☒ This institution has an approved assurance of compliance on file with HHS which covers this activity.

M1180 Assurance identification number 01NR IRB identification number

☐ No assurance of compliance which applies to this activity has been established with HHS, but the applicant institution will provide written assurance of compliance and certification of IRB review and approval in accordance with 45 CFR 46 upon request.

5. CERTIFICATION OF IRB REVIEW OR DECLARATION OF EXEMPTION

☒ This activity has been reviewed and approved by an IRB in accordance with the requirements of 45 CFR 46, including its relevant Subparts. This certification fulfills, when applicable, requirements for certifying FDA status for each investigational new drug or device. *(See reverse side of this form.)*

3/29/93 Date of IRB review and approval. *(If approval is pending, write "pending." Followup certification is required.)*
(month/day/year)

☐ Full Board Review ☐ Expedited Review

☐ This activity contains multiple projects, some of which have not been reviewed. The IRB has granted approval on condition that all projects covered by 45 CFR 46 will be reviewed and approved before they are initiated and that appropriate further certification *(Form HHS 596)* will be submitted.

☒ Human subjects are involved, but this activity qualifies for exemption under 46.101(b) in accordance with paragraph b2 *(insert paragraph number of exemption in 46.101(b), 1 through 5)*, but the institution did not designate that exemption on the application.

6. Each official signing below certifies that the information provided on this form is correct and that each institution assumes responsibility for assuring required future reviews, approvals, and submissions of certification.

APPLICANT INSTITUTION	COOPERATING INSTITUTION
NAME, ADDRESS, AND TELEPHONE NO. Office of Sponsored Programs and Research Room 506 Byrnes Building University of South Carolina Columbia, South Carolina 29208 (803) 777-7095	NAME, ADDRESS, AND TELEPHONE NO.
NAME AND TITLE OF OFFICIAL *(print or type)* Thomas A. Coggins IRB Administrator	NAME AND TITLE OF OFFICIAL *(print or type)*
SIGNATURE OF OFFICIAL LISTED ABOVE *(and date)* Thomas A. Coggins Am	SIGNATURE OF OFFICIAL LISTED ABOVE *(and date)*

HHS 596 (Rev. 1/82)

(If additional space is needed, please use reverse side under "Notes.")