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**LA THÈSE A ÉTÉ
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IMPROVING THE MEASUREMENT OF DEATH ANXIETY

by William R. McMordie

Thesis presented to the School of Graduate
Studies of the University of Ottawa, in
partial fulfillment of the requirements for
the degree of Doctor of Philosophy in
Clinical Psychology.

Ottawa, Canada, 1978



W.R. McMordie, Ottawa, Canada, 1978

This manuscript was typed on eight and one-half inches by eleven inches, bond paper, weighing twenty pounds to the ream. The manuscript was written according to the A.P.A. standards set forth in their publication manual (1975).

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CURRICULUM STUDIORUM

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ABSTRACT

The purpose of the project was to improve upon the reliability and validity of Templer's Death Anxiety Scale (DAS). Two scales were developed using Templer's items in a Likert format (LA Scale) and changing the item stems in a Likert format (LB Scale). The DAS, LA, LB scales, Marlowe Crowne scale, self perceived religiosity checklist and demographic data sheet were administered to 320 subjects and retested three weeks later on the death anxiety measures (N=281). Exploration of internal consistency, test retest reliability, construct validity, convergent validity, discriminant validity, concurrent validity and factor analysis indicated there was little difference between the death anxiety scales. The LA scale, however, was selected as the best scale because of higher internal consistency, greater discrimination ability between high and low scorers and it best defined a primary factor of death anxiety.

A second study using a neutral and death salient scenario was conducted. Subjects (N=121) role played a person described in a scenario and were administered the DAS and LA scales. There was no difference between the scales in discriminating between subjects in the scenarios. The LA scale made a greater number of discriminations between subject pairs. It was concluded that the LA scale offers advantages over the DAS. The LA scale is seen as having clinical utility by providing finer response distinctions and a greater range of scores.

INTRODUCTION

The subject of death anxiety has been a neglected topic of study in Psychology. It has only been within the last few years that very much research in this area has been attempted. The studies that have been attempted have frequently been criticized because of the questionable adequacy of the instruments used to measure death anxiety.

The purpose of the present study represents an attempt to improve the measurement of death anxiety. Templer's Death Anxiety Scale is used as a starting point from which to develop a new scale. Templer's scale was chosen as it represents the best measure of death anxiety currently available.

Templer's scale, however, is not a fully adequate measure. A new scale was designed which attempted to overcome the weaknesses of Templer's scale. Using the test construction procedures of Likert scaling and changing the item stems resulted in two new scales. Templer's scale and the two new scales were administered to a specific sample. The scales were compared to determine if the new scales were better than the Templer scale in terms of reliability and validity measures.

A second study was conducted to assess whether the Likert scale was better than Templer's scale in terms of concurrent, validity and discriminating between subjects.

Individuals were administered the best Likert scale along with Templer's scale after being exposed to one of two scenarios. One scenario is a death anxious scenario and the other is a relatively neutral scenario.

The present study is organized into four chapters. The first chapter includes a historical perspective of the area of death anxiety research, an evaluation of the most popular death anxiety scales and a presentation of Templer's DAS scale. Chapter Two presents the development of the Likert scales to be used in the present research. The third chapter consists of the experimental design of the present project, including a description of the instruments used, the methodology, and the samples used in the two studies. The presentation and discussion of the results of the project followed by conclusions and suggestions for further research are presented in the fourth chapter. A bibliography and various appendices follow the fourth chapter.

CHAPTER I

REVIEW OF THE LITERATURE

Chapter I consists of three sections. The first section presents a brief historical perspective and the current status of death anxiety research. The second section presents a critical evaluation of existing measures of death anxiety. The chapter ends with a presentation of Templer's scale and a presentation of its weaknesses.

The current project developed out of this writer's interest in death anxiety. Historically, the area of death has been a taboo topic (Farberow, 1966). C.W. Wahl (1965) made the analogy that the study of death in modern time is very much a taboo topic in the same vein that sex was in Vienna at the time of Freud. Fulton writes, "Death, like a noxious disease, has become a taboo subject in American society and as such it is the subject of much avoidance, denial, and disguise" (Fulton, 1967, p. 32). In much the same vein Lipson (1969) writes that the attitude of our culture has been to deny the reality of death. More recently it has been said, "...death is a topic surrounded by a symbolic taboo screen that colors the way in which it is perceived and, in fact, discourages looking directly at the phenomenon" (Vernon and Payne, 1973, p. 63).

It certainly comes as no surprise that the experimental

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literature in the area reflects the "tabooness" of the topic. It has been said, "Death has been a consistently untouchable area for study and research" (Aronson, Furst, Krasner and Liff, 1962). Kastenbaum and Aisenberg (1972) go so far as to assert that "no topic in psychology has been more neglected through the years" (p. 1). Feifel (1960) states that one cannot help but to be impressed by the paucity of research in the area. He maintains that the subject of death is indeed a relevant variable in psychology.

The outstanding lack of research in the area might seem more credible if the subject matter were new to the psychological arena, but such is not the case. The following quotation was written in 1933 by Eliot:

Great souls have, to be sure, always pondered the problem of the cessation of self, and have written great words into the human record. They have done so, however, as seers, poets, prophets, philosophers, novelists, biographers, not as scientists. Physicians have made a beginning on the physiological side, Psychologists and physicists have shown skeptical or credulous but inconclusive interest in "physical research". It remains to apply modern techniques of case histories, group studies, and documentary analysis to the attitudes and actual behavior of

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people toward death. Only upon such a basis slowly to be accumulated, compared and worked over, can a social psychology of death be built up which can be of social value. (pp. 380-81)

To go back further, Lester (1967) traces the interest in psychological aspects of death to an article written on old age and death in 1896 by Scott in the American Journal of Psychology. The psychologists' interest in the subject matter of death is certainly not of recent vintage. However, research in the area is currently in its infancy.

Dickstein and Blatt (1966) suggest that only within the last ten years "has there been a systematic examination of the relevance of death concern as a psychological variable" (p. 11). Kastenbaum (1965) states that interest in psychological aspects of death has been growing recently. The increase of interest in the subject matter of death has taken two directions according to Lester (1967). One is the management of the dying patient and the other being the fear of death.

Generally the findings of research on death anxiety have led to contradictory hypotheses and yielded inconclusive results (Handal, 1969). Feifel and Branscomb (1973) state that there are few empirical studies and these suffer from

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poor conceptualization, limited populations and limited measurement. Lester (1967) states that the reliability and validity of the instruments used to measure death anxiety have rarely been considered. Durlak (1973) has been quite critical of research on death anxiety, questioning the adequacy of the measuring instruments used to assess death anxiety.

Thus far in the discussion no mention has been made of the theoretical literature of death anxiety. Kastenbaum and Costa (1977) in the first critical survey of the psychology of death appearing in the Annual Review of Psychology state that there have been only scattered theoretical references to death anxiety and that "none of the brand name theories or text books in these areas (cognitive, personality, social) have treated death as though it were a central concern or influence" (p. 228-229).

Stolorow (1973) in reviewing the psychoanalytic interpretations of death anxiety states that there are two schools of thought. The first is that death anxiety is a secondary phenomenon, a result of other unconscious complexes. He cites popular psychoanalytic notions of death anxiety as castration fear, fear of object loss or separation and as a result super ego dynamics as examples. The second school of thought is that all anxiety has its basis in the fear of death. This is the view that the aim of all life is death in Freud's postulated death instinct. The psychoanalytic interpretations of death anxiety are not widely held.

Theoretical literature on death anxiety has appeared in existential writings. This has been largely in the context of existential philosophers attempting to elaborate on the ontological nature of anxiety in general (Stolorow, 1973). Nagy (1948)

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elaborated on a theory of the child's concept of death and how it developed. Kastenbaum and Aisenberg (1972) hypothesized that an individual's perception of death undergoes developmental transformation. More recently, McDonald (1976) has emphasized the view of death anxiety as a learned phenomena.

It is generally agreed that there is a lack of sound theoretical writings. Many writers have been recently stressing the concept of death anxiety as a multidimensional phenomena (Feifel, 1969; Stolorow, 1973; McDonald, 1976 and Kastenbaum and Costa, 1977). The present project does not attempt to address theoretical validity of death anxiety. This is a task for future researchers. In the present project the stance taken by Templer--that death anxiety is the anxiety one feels when they think about his own death--is used as a starting point.

Evaluation of Death Anxiety Scales

The first scale constructed to measure death anxiety was Boyar's FODS scale (Boyar, 1964). Since the appearance of the FODS scale there have been numerous attempts to construct scales that measure death anxiety. The psychometric characteristics of these scales have rarely been explored. The present review examines the psychometric properties of the six most popular scales in use today. The criteria for being included in the review is that at least five studies were published using the scale. The death anxiety scales selected for review were developed by Boyar (1964), Lester (1969), Templer (1969), Handal (1969), Collett and Lester (1969) and Dickstein (1972). The Boyar scale consists of eighteen items, the Lester scale twenty-one items, the Templer scale fifteen items, the Handal scale twenty items, the Collett-Lester scale thirty-two items, and the Dickstein scale thirty items. All the scales are purported to measure death anxiety by their authors.

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It should be pointed out that there are at least three times as many death anxiety scales in the literature as the current number being reviewed. Many of these appear to be a one time affair for the purpose of a particular study. A few of the scales represent a serious attempt at scale construction. Unfortunately, only one study has been published for the majority of these scales.

Content Validity

Content validity deals with the sampling adequacy of the content area of the measuring instrument (Anastasi, 1968 and APA, 1974). Nunnally (1967) presented two major standards for ensuring content validity: 1) a representative collection of items and 2) a sensible method of test construction (p. 81). If judged by these two criteria the six death anxiety scales would be considered to be marginally adequate with respect to content validity. However, circumstantial evidence for the content validity of a scale can be obtained by considering other types of validity i.e. construct, convergent, discriminant, criterion-related, factorial composition of a scale and internal consistency. It is this writer's opinion that Nunnally's two criteria are not enough to demonstrate a scale's content validity. Therefore, a marginally adequate level of content validity will be considered to be demonstrated when at least three

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studies beyond the author's original scale presentation article provides circumstantial evidence for content validity.

The content validity of the Boyar, Handal, Collett-Lester and Dickstein scale is considered unacceptable because an insufficient number of studies appear in the literature which can provide any type of circumstantial evidence for the scales' content validity. Evidence for the content validity of Lester's scale has not been adequately demonstrated. Durlak (1972) offered evidence in support of the concurrent validity using intercorrelations of the subscales. Lester's scale was found to be negatively correlated with purpose in life as predicted in two studies (Durlak 1972 and Blazer, 1973). Although the studies presented thus far offer some circumstantial evidence for content validity of Lester's scale a study conducted by Durlak (1973) raised serious questions about the scales utility as a death anxiety instrument. Durlak found no relationship whatsoever between Lester's scale and five measures of death concern and contact.

Templer's scale is the only scale for which very much circumstantial evidence has been accumulated. Numerous studies have demonstrated that the Templer's scale was not correlated with age and that females tend to score higher

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than males on the DAS. Templer's scale has been shown to be positively correlated with emotional reactions to death related words (Templer, 1971), subjects who openly admit to being afraid of death (Templer, 1971 and Carson, 1974) and fantasy confrontation with death (Taube, 1975). Two studies have demonstrated a reduction in death anxiety on the Templer scale after participation in a death awareness workshop as predicted by the authors (Murray, 1974 and Laube, 1977). Several studies have shown the DAS to positively correlate with general measures of anxiety. The low magnitude of these correlations have been used as evidence for the discriminant validity of Templer's scale. Smith (1977) concluded that death anxiety as measured by the DAS is a unique personality variable when 18 scales of the CPI accounted for only twenty-six percent of the variance in a multiple linear regression analysis.

Construct, Convergent and Discriminant Validity

Construct validity is the degree to which the scale or test (1) actually measures a given construct (Cronbach and Meehl, 1955) and (2) may serve as an operational definition of the construct (APA, 1974). The construct validity of a scale must be demonstrated through continuing research where the scale "ties into a network of related concepts" (Bunkel and McGrath, 1972 p. 162).

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To validate his scale Boyar (1964) embedded his scale in a questionnaire about safety patrolmen. A group of fifty-six subjects saw a fatal car wreck film while a control group of forty subjects saw a film on urban traffic problems. The group that saw the fatal car wreck film had a significantly higher mean score than the control group. The Boyar scale was found to be significantly correlated with the Templer scale .74 (Templer, 1970) and the Lester scale .52 (Lester, 1967a). The Boyar scale has been found to be unrelated to suicidal persons (Lester, 1967a), sex and siblings (Lester, 1969) and need to achieve (Lester, 1970). In these three studies the observed relationships were similar for the results of the Boyar and Lester scales although no direct comparisons were made. The meager research conducted with the Boyar scale cannot be considered substantial enough to provide an adequate demonstration of the construct validity of the scale. Templer (1970) observed that the construct validity of the Boyar scale had not been thoroughly determined which is still true today.

To validate his scale Lester used answers to questions concerning thoughts of death and death behaviors i.e. reactions to funerals, as validating criteria (Lester, 1967). The Lester scale as previously reported was found to be positively correlated with the Boyar scale (Lester, 1967a).

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The Lester scale has been found to be unrelated to suicidal persons (Lester, 1967a), sex and siblings (Lester, 1969), need to achieve (Lester, 1970), purpose in life (Durlak, 1972) and five measures of death concern and contact (Durlak, 1973). In one study, student nurses with advanced training obtained lower scores on the Lester and Collett-Lester scales than nursing students with less education as predicted (Lester, Getty, Kneisl, 1974). Two studies have appeared in the literature in which both the Lester and Templer scales were used. Berman and Hays (1973) found females scoring higher than males on both scales and no relationship between the scales and belief in afterlife. Templer, Lester and Ruff (1974) found a weak positive relationship between femininity and both scales and low positive correlations between the scales and the Costello-Comrey Anxiety scale. The construct validity of Lester's scale has not been adequately demonstrated. Serious questions have been raised about Lester's scale as a measure of death anxiety since Durlak found the scale unrelated to five measures of death concern and contact.

Handal used estimates of life expectancy, death contact, church attendance and frequency of death discussions in the validation of his scale. (Handal, 1969). Handal's scale was found to be significantly correlated with general anxiety. The low correlation (.33) was used by the author to assert that his scale seems to tap a different aspect of anxiety

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(Handal, 1969). Handal and Rychlak (1971) reported a curvilinear relationship between admission of death anxiety and recalling of unpleasant dream content in two studies. They concluded that the results support the validity of the Handal scale as a measure of death anxiety and also as a measure of repression. The Handal scale was found to be positively correlated with repression-sensitization scales in three studies (Handal and Rychlak, 1971 and Handal, 1973). The meager research conducted with Handal's scale does not provide enough evidence to make any decisions about the construct validity of the scale.

The Collett-Lester scale is an outgrowth of the scale developed by Lester. The authors in the development of the Collett-Lester scale started with the premise that the Lester scale was valid (Collett and Lester, 1969). Lester (1972a) reported the results of three studies with the Collett-Lester scale. The findings suggested that age was not correlated with the scale. Females scored higher than males, and evaluative ratings of death using a semantic differential was significantly related to the scale. Cohen and Parker (1974) found the Collett-Lester scale to be unrelated to fear of failure. A study found, as predicted, that increased levels of nursing education would result in lower scores on the Collett-Lester and Lester scales

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(Lester, Getty and Kneisl, 1974). Conflicting results were reported in a study by Kulychek (1976). He found belief in afterlife related to only one of the four subscales of the Collett-Lester scale. In contrast to the earlier findings of Lester (1972a) a study by Fang and Howell (1977) found no difference between males and females on the Collett-Lester scale. The Fang and Howell study also found the Collett-Lester scale to be unrelated to religious affiliation and field of study for graduate students. The construct validity of the Collett-Lester scale is considered unknown because of conflicting results and the use of questionable criterion.

A more thorough validation process was undertaken by Dickstein in the development of his scale than the other scales considered thus far. Dickstein explored the construct validity of his scale by investigating its relationship with the Manifest Anxiety Scale, State-Trait Anxiety Inventory, Repression-Sensitization Scale, Internal-External Scale and the Edwards Personal Preference schedule (Dickstein, 1972). Dickstein hypothesized and found his death concern scale to be positively related to state anxiety, trait anxiety, sensitization for females and to manifest anxiety for males and females. The hypothesized relationship between his scale and externality was not confirmed. No sex difference was found using his scale (Dickstein, 1972). In a series

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of studies it was hypothesized and explored that Dickstein's scale contained two factors of death anxiety (Klug, 1976; Klug and Boss, 1976 and Klug and Boss, 1977). The authors hypothesized that Dickstein's scale contained a conscious contemplation and a negative evaluation of death anxiety. These two factors were confirmed in two studies using judge's ratings and factor analysis (Klug and Boss, 1976 and 1977). Templer's scale was found to correlate positively in two samples with the conscious contemplation factor (.42 and .49) and the negative evaluation factor (.68 and .60). The authors concluded from their results that the Dickstein and Templer scales were measuring a similar construct (Klug and Boss, 1977). Although the Dickstein scale looks promising with respect to construct validity its construct validity must be considered unknown at this time. There simply has not been enough research providing consensual validation to earlier findings and relating the scale to other variables.

To establish construct validity of the DAS, two separate studies were conducted (Templer, 1970). In the first project, a group of twenty-one psychiatric patients known to have high death anxiety by their own report and a group of twenty-one psychiatric patients matched for age, sex, and diagnosis were administered the DAS. The DAS means for the two groups were 11.62 and 6.77 respectively.

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The difference was statistically significant at the .01 level. Templer concludes, "psychiatric patients who spontaneously verbalize death anxiety concern have higher DAS scores than other psychiatric patients" (p. 169).

The second study involved seventy-seven undergraduate students. The students completed the first 366 items of the MMPI and were given a fifteen minute break. After the fifteen minute break, the students were given a word association task to write down ten associations to the word death and four buffer words. The students then completed the MMPI with the DAS items embedded in the last two-hundred items and Boyar's Fear of Death Scale (FODS).

Templer stated that the FODS was used as a means of determining the validity of the DAS. Although the construct validity of the FODS has not been thoroughly determined, it was chosen because the author believed it to be the most adequate measure at that time. The DAS and FODS correlated .74 from which Templer concluded that the high relationship supported the validity of both scales. The number of emotional word associations to the word death correlated significantly (.25) with the DAS at the .05 level. Templer stated that it seems plausible affective associations to the word death might be a sign of death anxiety.

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In the study previously reported, the MMPI was used for two reasons. First, the MMPI contains three well-known measures of anxiety (Manifest Anxiety Scale, Welsh Anxiety Scale, and Welsh Anxiety Index). If the DAS were to correlate as highly with the anxiety measures as the anxiety measures intercorrelated with each other then it could be reasonably argued that the DAS is simply another measure of general anxiety rather than death anxiety in particular. The DAS correlations with the anxiety measures ranged from .18 to .39 and the intercorrelations of the anxiety measures ranged from .60 to .78. Templer concluded that the results provide evidence for discriminant validity.

The second reason for using the MMPI was to determine possible relationships of the DAS to personality variables. The low correlations obtained did not support the impression that death anxiety may be related to psychopathology as measured by the MMPI.

Templer published a report in 1971 in which he summarized the results of seven different studies using his scale on over 3600 subjects. He reported that females consistently score higher than males and that the DAS scale was not related to age (Templer, 1971). Numerous studies have confirmed the sex difference (Pandey and Templer, 1972; Berman and Hays, 1973; Lucas, 1974; Brown, 1975; Klug, 1976; Schultz, 1976 and McDonald, 1976). The Pandey and

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Templer (1972) study reported that black and white females consistently score higher than their male counterparts.

The only instance in which males have scored higher than females was reported by Lucas (1974). He found surgical patients obtaining higher scores than their wives. The Berman and Hays (1973) study demonstrated the sex difference on the Templer and Lester scales. Several studies have also consistently shown the Templer scale not to be related to age (Salter and Salter, 1975; Laube, 1977; Smith, 1977; and Bascue and Lawrence, 1977).

Several studies have found the Templer scale to be positively correlated with various measures of anxiety (Templer, 1971; Lucas, 1974; Templer, Lester and Ruff, 1974; and Smith, 1977). The low correlations have been used by the authors to assert that the Templer scale has discriminant validity and measures something other than general anxiety.

It was stated earlier that Templer did not find his scale related to the MMPI in any predictable manner. Similar results were found in two other studies (Lucas 1974; Templer and Lester, 1974). Psychiatric patients have been found to score higher than normals (Templer, 1970; Templer, 1971a; Templer and Ruff, 1975). There does appear to be some evidence that Templer's scale may be related to depression (Templer, 1971a; Templer, Ruff and Simpson, 1974; Smith, 1975). The scale was found not to be related to extraversion

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and only weakly with neuroticism in a study by Templer (1972).

Many studies have attempted to find a relationship between Templer's scale and various measures of religiosity (Templer and Dotson, 1970; Templer, 1972; McCarthy, 1975; Templer and Ruff, 1975; McDonald, 1976; Bascue and Lawrence, 1977; Liang, Kahana and Tagore, 1977). The results of these studies have not demonstrated any consistent pattern or relationship between Templer's scale and the variable of religiosity.

A few studies have been conducted in which it could be reasonably estimated that certain groups would demonstrate high death anxiety. As previously reported, psychiatric patients have consistently had higher scores than normals. No relationship was found between Templer's scale and smoking (Templer, 1972), midlife career changes (Clopton, 1973), suicide attempters (Tarter, Templer, and Perley, 1974), recent widows (Smith, 1975) and risk taking behavior (McDonald 1976). Positive relationships were reported between the Templer scale and subjects admitting fear of death (Carson, 1974), fantasy confrontation with death (Taube, 1975) and reading about one's own death (Brown, 1975). In two studies where nursing students participated in a death and dying workshop scores on the Templer scale decreased as predicted after exposure to the workshop (Murray, 1974; Laube, 1977).

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Several studies have been conducted comparing Templer's scale to other variables. Two studies found that children's scores on the scale were similar to their parents scores (Templer and Ruff, 1971; Lester and Templer, 1972). Templer (1971) found his scale to be positively related with death related words. The scale was found not to be related to belief in afterlife in a study by Berman and Hays (1973). A weak positive relationship between the scale and femininity was found in a study by (Templer, Lester, and Ruff, 1974). Two studies reported a negative relationship between Templer's scale and purpose in life (Brown, 1975; McCarthy, 1975). Bascue and Lawrence (1977) found Templer's scale to be positively correlated with the time reference inventory. In a study by Smith (1977) low scores on Templer's scale were associated with high scores in the Psychological Mindedness and Personal Adequacy scales of the CPI.

The construct validity of the Templer scale is considered by this writer to be marginally acceptable. The consistency of results obtained in comparing the scale to sex, age and anxiety are impressive. It is this writer's opinion, however, that there have not been enough studies with death relevant criteria to establish the construct validity of Templer's scale as a "death anxiety" measure.

Evidence for the convergent validity of the scales is found in studies where more than one death anxiety scale is used.

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High intercorrelations and similar relationships to variables are indicative of convergent validity between the scales. The Boyar, Lester and Dickstein scales are judged to be marginally acceptable with respect to convergent validity. There are at least two studies in which each of the scales has been shown to be positively related to some other measure of death anxiety. The convergent validity of the Templer scale is considered acceptable because there are five studies which found Templer's scale to be positively related to other death anxiety measures (Boyar scale-Templer, 1970; Lester scale-Berman and Hays, 1973; Templer, Lester and Ruff, 1974; Dickstein scale-Klug, 1976; Klug and Boss, 1977).

There is only one scale on which enough research has been conducted to provide evidence for the discriminant validity of the scale. Templer (1970) reported low correlations with his scale and several anxiety measures (MAS-Manifest Anxiety Scale, WAS-Welsh Anxiety Scale and WAI-Welsh Anxiety Index). He used these results as support for the discriminant validity of his scale. Other studies have reported similar results (Costello and Comrey Anxiety Scale-Templer, Lester and Ruff, 1974; State and Trait Anxiety Scales, MAS, WAS and WAI-Smith, 1977). Although the consistency of the results are impressive Kastenbaum

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and Costa (1977) suggest an alternative interpretation to evidence for discriminant validity. They suggest that the death scale may simply be a poor measure of general anxiety. The findings from the research does seem to suggest that the discriminant validity of Templer's scale is at least marginally acceptable.

Concurrent and Predictive Validity

The data for making an appraisal of concurrent validity of the scales is limited to five studies, one involving the Boyar and four involving the Templer scale. The study in which Boyar (1964) showed a fatal car wreck film and a control film suggests that the scale may have some concurrent validity. Concurrent validity of the Templer scale is suggested from Templer's (1971) and Carson's (1974) studies in which subjects were tested with Templer's scale who admitted to fearing death, from Taube's (1975) study in which she used a fantasy death confrontation exercise and from Brown's (1975) study in which subjects read about their own death.

The predictive validity of the death anxiety scales are considered unknown. Three studies have appeared where the prediction was made that death anxiety would

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decrease after nursing students were exposed to a workshop. In all three studies the prediction was affirmed (Lester and Collett-Lester scales-Lester, Getty and Kneisl, 1974; Templer scale-Murray, 1974; Laube, 1977). No studies, however, have appeared in the literature which predicted an increase in death anxiety scores in the future and tested that assumption.

Reliability

The reliability of the various death anxiety scales has not been well established. Only Templer's scale has been examined in more than one study. No reliability data is reported for the Collett-Lester scale. For the remaining scales reliability data was obtained by the scales' developer from a single study.

Data on the internal consistency of the scales is sparse. Dickstein reported three split-half reliability coefficients ranging from .86 to .88 for three groups of subjects (N=160, 192, 151) (Dickstein, 1972). There are three studies in the literature which examined Templer's scale. Templer found a Kuder Richardson-20 coefficient of .76 for his scale on a sample of thirty-one subjects (Templer, 1969). The author accepted this coefficient as demonstrating an adequate internal consistency estimate of reliability. This coefficient is considered too low by this writer.

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Templer (1970) reported satisfactory internal consistency using item analysis procedures on three groups of subjects (N=141). Liang, Kahana and Tagore (1977) administered Templer's scale to Indian, Japanese and American subjects to cross-culturally validate the scale. They reported poor internal consistency estimates using Cronbach's coefficient Alpha ranging from .33 to .55. Boyar found a split-half internal consistency estimate of .83 for 100 subjects who were administered his scale. But reliability based upon item statistics was only .21 (Boyar, 1964). A parallel-forms reliability of .65 was reported by Lester (1969). No internal consistency data was reported for the scales developed by Handal or Collett and Lester. Of the research conducted on the various scales only Dickstein's three internal consistency estimates of reliability appear to offer strong support for the internal consistency of a scale.

As far as test-retest reliability is concerned several scales appear to be fairly stable. Dickstein reported a reliability for his scale of .87 for 151 female subjects after a two month period (Dickstein, 1972). Handal obtained a test-retest reliability of .85 for 116 subjects over a three month interval (Handal, 1969).

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A test-retest coefficient of .83 was reported by Templer after readministering his scale to thirty-one subjects after three weeks (Templer, 1969). Boyar obtained a test-retest coefficient of .79 when 100 subjects took his instrument a second time, after ten days (Boyar, 1964). The short time interval makes the reliability suspect. The poorest test-retest reliability was obtained for the Lester scale. A reliability of .58 was obtained after a six week period for fourteen subjects. No test-retest reliability data was reported for the Collett-Lester scale.

The internal consistency and stability of the death anxiety measures are not considered well established because one study is not sufficient to prove a measure's internal consistency or test-retest reliability. Overall, the internal consistency and test-retest reliability of the death anxiety scales has not been adequately demonstrated.

Response Sets

Many writers have stated that any new scale must be correlated with response set measures (Campbell, 1960; Nunnally, 1967; Anastasi, 1968; Edwards, 1970). It is somewhat surprising that only two of the scales have been correlated with social desirability. Durlak (1972) reported that there was no relationship between the Lester scale and the Marlowe-Crowne Social Desirability Scale.

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Templer found his scale unrelated to the Couch and Keniston Agreeing Response Tendency Scale in one study and unrelated to the Marlowe-Crowne Social Desirability Scale in another study (Templer, 1970). Unfortunately the sample sizes in all three studies were small.

With reference to Table 1 the following criteria were used. The death anxiety scales reviewed were utilized in five published studies. The criteria used to demonstrate an acceptable level of internal consistency reliability was set at .80. The test-retest reliability criteria sufficient to demonstrate an acceptable level was considered a coefficient above .80 that was replicated in more than one study.

The criteria for demonstration of an acceptable level of content validity is based on a consideration of several factors: validity measures (construct, convergent, discriminant and criterion related), factorial composition of the scale and internal consistency. An adequate level of content validity was set at three studies providing circumstantial evidence for content validity and this writer's opinion that the circumstantial evidence interrelated so as to suggest adequate content validity.

The criteria used to demonstrate construct validity was that the death anxiety scale under consideration had been related to several variables across different studies in a consistent manner. These relationships whether positive or negative should "fit" in terms of the scale measuring a

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construct of death anxiety. It was judged that no scale could be considered to have an adequate level of construct validity unless the scale had been used in several studies with death relevant criteria.

The criteria used to demonstrate an acceptable level of convergent validity was that the scale under consideration had been shown to be positively correlated at .60 or above with other death anxiety scales. The criteria for demonstrating discriminant validity was that the scale had been shown to have low correlations (below .40) with anxiety scales--which death anxiety scales should differ from--in several studies.

The concurrent validity of a scale was judged marginally acceptable when a death relevant criterion was used as the experimental manipulation in a study and the author's expectations confirmed with respect to the data obtained from the death anxiety scale. The criteria for demonstrating predictive validity of a scale were studies that predicted and showed 1) a reduction of death anxiety at some future date and 2) an increase of death anxiety at some future date.

The criterion chosen to demonstrate an acceptable level of absence of response set for a scale was at least one study using a large sample size that indicated that the scale was not related to social desirability.

Table 1 summarizes this writer's evaluation of the scales' shortcomings considering the review of research. The results from Table 1 indicate that the Templer scale

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is the most adequate death anxiety scale. This finding would support the view that the Templer scale is the most widely used and most reliable and valid measure of death anxiety currently available (Brown, 1974; Lucas, 1974; Klug, 1976). The Dickstein scale appears to have merit as a potentially useful instrument. Unfortunately very little research has been conducted using this scale. The properties of the other scales have little evidence to recommend its usage at the present time with the possible exception of the Boyar scale.

Table 1
Summary of Scale Properties

PROPERTY	BOYAR	LESTER	TEMPLER	HANDAL	COLLETT- LESTER	DICKSTEIN
Internal consistency reliability	Unacceptable	Unacceptable	Unacceptable	Unknown	Unknown	Acceptable
Test-retest reliability	Unacceptable	Unacceptable	Marginally acceptable*	Marginally acceptable	Unknown	Marginally acceptable
Content validity	Unacceptable	Unacceptable	Marginally acceptable	Unacceptable	Unacceptable	Unacceptable
Construct validity	Unknown	Unacceptable	Marginally acceptable	Unknown	Unknown	Unknown
Convergent validity	Marginally acceptable	Marginally acceptable	Acceptable	Unknown	Unknown	Marginally acceptable
Discriminant validity	Unknown	Unknown	Marginally acceptable	Unknown	Unknown	Unknown
Concurrent validity	Marginally acceptable	Unknown	Marginally acceptable	Unknown	Unknown	Unknown
Predictive validity	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Absence of response set	Unknown	Marginally acceptable	Marginally acceptable*	Unknown	Unknown	Unknown

* - Data are insufficient to consider acceptable

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All the scales are in need of further research and validation to overcome deficiencies in a number of important areas. It can also be stated that much additional validation evidence is needed, especially research using death relevant criteria i.e., known group, death scenarios, fantasy confrontation, death films and readings, etc. before it can be stated with some degree of certainty that the scales measure what they purport to measure.

From the review of the literature it is apparent basic technological research on improving death anxiety measurement is of paramount importance. The current research project attempts to furnish an improved instrument for measuring death anxiety.

Templer's Death Anxiety Scale (DAS)

Templer's Death Anxiety Scale was chosen for the research project as it appears to be the most adequate death anxiety instrument. The instrument, however, does appear to have a number of deficiencies. Templer (1976) has commented on the limitation of his DAS instrument and the need for its improvement psychometrically. Templer stated that for determining group differences and correlations with large numbers of subjects the DAS is satisfactory. He has expressed a need for improvement

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in the DAS before any inference can be made beyond those previously mentioned (Templer, 1976).

Templer's scale is a fifteen item true-false scale yielding a single score (Templer, 1969, 1970). Templer's scale is presented on the following page in Table 2. Templer started with an item pool of forty brief statements that were judged independently by seven raters to reflect death anxiety. Death anxiety was defined as anxiety which is precipitated by one's reflection on the prospect of his/her own cessation. This definition of death anxiety is the most accepted in the literature (Klüg, 1976). Each statement was rated from one to five for its degree of relationship to death anxiety.

Thirty-one items were judged as being moderately or highly related to death anxiety. The thirty-one items were embedded in the last 200 items of the MMPI and administered to three separate groups of college subjects (N's of 45, 46, and 50). The fifteen items for which the item-total score point biserial correlation coefficients were significant at the .10 level in two out of the three analyses were selected for the final scale. As a measure of item interdependence, phi coefficients between items were computed. Templer concluded that there was not excessive interitem redundancy since none of the correlation

Table 2
Templer's Death Anxiety Scale Items

Key	Content
T	I am very much afraid to die.
F	The thought of death seldom enters my mind.
F	It doesn't make me nervous when people talk about death.
T	I dread to think about having to have an operation.
F	I am not at all afraid to die.
F	I am not particularly afraid of getting cancer.
F	The thought of death never bothers me.
T	I am often distressed by the way time flies so very rapidly.
T	I fear dying a painful death.
T	The subject of life after death troubles me greatly.
T	I am really scared of having a heart attack.
T	I often think about how short life really is.
T	I shudder when I hear people talking about a World War III.
T	The sight of a dead body is horrifying to me.
F	I feel that the future holds nothing for me to fear.

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coefficients exceeded .65.

Although no actual norms have been established for the DAS, considerably more data is available on it than any other death anxiety scale. In 1971 Templer tabulated his results from seven different studies for twenty-three categories of subjects involving over 3600 adults and adolescents. Templer (1971) reported that scores range from 0 to 15; the means of normal subjects ranging roughly from 4.5 to 7.0; the standard deviations a little over 3.0.

In Table 1 the Templer scale's properties were presented as compared to other popular death anxiety scales. The Templer scale was found to be unacceptable with respect to internal consistency. Crano and Brewer (1971) state that "if a coefficient is not at least in the high .80's", it cannot satisfy the criterion of internal consistency. No studies have been reported which satisfy the above criteria. The low internal consistency coefficient is primarily a function of the true and false scoring format of the Templer scale. The relationship between number of response categories per item and internal consistency estimates of reliability will be presented in the next chapter.

It was mentioned that the test-retest reliability and absence of response set for the DAS was considered

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marginally acceptable when compared to the other scales. The data are insufficient to consider fully acceptable at this time.

It may be that Templer's (1970) reported test-retest coefficient of .83 is spuriously high. Considering the emotional impact of this short scale answered in a true-false manner, it seems reasonable to postulate that an individual might remember his/her response to a high number of items even after a three week interval. Death related words have been found to have an emotional impact on the subject (Golding, Atwood, and Goodman, 1966; Templer, 1971).

Templer (1970) investigated whether the DAS would be affected by response set. With a sample of thirty-seven students, he administered the Couch and Keniston measure of agreeing response tendency. A non-significant correlation of .23 was obtained between the DAS and response tendency scale. The Marlowe-Crowne Social Desirability Scale was administered with the DAS to a sample of 46 college students. The tendency to respond in a socially desirable direction correlated .03 with the DAS. The author concluded from these two samples that response set is not appreciably related to the DAS instrument.

The results of these studies provide only marginal

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evidence that response set is not related to the DAS. The Couch-Keniston and DAS correlation approaches significance at the .10 level. The Marlowe-Crowne and DAS correlation, although highly significant, provides only weak support that response set is not related to the DAS.

The relationships reported are not considered strong evidence because of the sample sizes used. In the two previously mentioned studies with N's of 37 and 46 students, the range of scores was not reported. With 16 scores possible, ranging from 0 to 15, it seems reasonable to question whether or not a restricted range of scores would be obtained using only 37 or 46 subjects. With a restricted range of scores, correlations of the DAS to measures of response tendency will be of lower magnitude than their true relationship. The relationship of response set to the DAS remains to be clearly established.

It was previously stated that Templer considered the DAS an adequate scale if a large number of subjects are used. This reflects the lack of discrimination ability of a scale presented in a true-false format. The relationship between number of response categories and discriminative power will be presented in the next chapter.

The DAS contains weaknesses. The chief weakness appears to be the true-false format of the scale. Other

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shortcomings in the scale result primarily from the true-false nature of the scale and they are: 1) the internal consistency of the scale is poor; 2) the test-retest relationship is not clearly established; 3) the relationship of response set to the DAS is not clearly established; 4) the structural properties of the instrument provide only true and false options resulting in a possible agreeing response tendency; 5) the discriminative power of the scale is weak.

These conclusions identify the research needs for improving Templer's scale. The next chapter will present the Likert scales devised to improve upon these weaknesses.

CHAPTER II

DEVELOPMENT OF LIKERT SCALES

The present chapter consists of three sections. The first section involves the development of the Likert scales to improve upon the weaknesses of Templer's instrument. The second section presents the validation process of the Likert scales used in the present project. The chapter concludes with a presentation of the hypothesis.

The intention of the present study is to improve the measurement of death anxiety. The conversion of the DAS into a Likert format is assumed to bring about some degree of improvement. It is further assumed that the degree of improvement will be increased in changing the item stems. Therefore, the present study attempts to improve upon Templer's scale in two respects.

The first method chosen to improve the psychometric characteristics of the DAS is adapting it to a Likert format. The first Likert conversion (LA Scale) is presented in the appendix.

The Likert scale procedure was selected for use in the present study because of the advantages it offers over other scaling procedures. The Likert technique is viewed as offering the following advantages over other scaling procedures in the present project: (1) ease of

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scale construction, (2) higher reliability and (3) providing more precise information about one's opinions.

Likert (1932) developed his scaling technique to improve upon the Thurstone method of scale construction which he viewed as "exceedingly laborious" (p. 149). Likert hypothesized that his simpler method was faster than Thurstone's and that it would prove to be equally or more reliable and valid than Thurstone's. Edwards and Kenney (1946) in comparing the Likert and Thurstone methods of scale construction concluded: "What evidence we do have (and it is subjective) seems to indicate that the Likert technique is less time-consuming and less laborious than the Thurstone Technique" (p. 82).

A study was conducted by Barclay and Weaver (1962) to examine the time involved in the construction of Likert and Thurstone scales. Two Thurstone and two Likert scales were developed from a common pool of items. The time involved in compiling the items was not included in the scale construction time. The authors kept a log of the time involved to construct the Likert and Thurstone scales. The Likert scales were constructed in 69.8 per cent the amount of time required to construct the Thurstone scales. The authors conclude that the Likert technique offers a considerable time savings over the Thurstone technique.

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This conclusion was questioned by Seiler and Hough (1969) because the authors did not use faster available methods of Thurstone scale construction and the greater number of judges used in their construction of the Thurstone scales than the Likert scales. Seiler and Hough state that although many writers have suggested that the Likert methodology is faster than the Thurstone technique this has not been empirically established.

The Likert method of scale construction has not been directly compared to the Guttman technique in terms of ease of construction and time required to develop the scale. Several writers have discussed the Guttman technique as laborious and difficult (Selltitz, Jahoda, Deutsch and Cook, 1966; Nunnally, 1967).

The general consensus of opinion from the review of the literature is that the Likert is simpler and faster to construct (Selltitz et. al 1966; Nunnally, 1967; Seiler and Hough, 1969; Crano and Brewer, 1971 and Kerlinger, 1973). The ease and speed of scale construction is considered advantageous in the present project but not of prime importance.

The methodology by which the Likert scale is constructed does offer an advantage to other scale construction techniques given the limitations of the

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experimental design of the project. It was the writer's intention to try to bring about some degree of improvement with Templer's fifteen item scale. This approach would preclude the gathering of a large number of statements to be rated by a large number of judges which is done in the Thurstone and Guttman scale construction procedures. It also appeared doubtful, to this writer, that Templer's fifteen items could be so arranged that a good unidimensional scale could be developed which is the essence of the Guttman methodology.

One of the major flaws of the DAS in its current format is the True-False method of responding to a short fifteen item scale. The Thurstone and Guttman techniques are similar in that items are responded to in a dichotomous manner. The Likert technique offers the advantage of several response categories for each item.

In his original article Likert (1932) compared Thurstone and Likert scales using the results of 650 respondents randomly selected from over two thousand students who were administered several attitude scales. Likert compared the split-half reliabilities for two groups of subjects on a twenty-four item Likert internationalism scale and the 44 item Thurstone-Droba war scale. The split-half reliabilities obtained for the two groups on the

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Likert scale were both .88 and for the Thurstone scale were .88 and .85. Likert concluded that his technique could produce a scale of equal split-half reliability to that of a Thurstone scale by using about half as many items.

In the same study Likert administered the Thurstone-Droba war scale Form A and B twice to a group of fifty-four subjects. In the first administration, the scale was responded to using the Thurstone scoring methodology. In the second administration, the subjects were instructed to respond using a Likert scoring procedure. The Likert scoring method produced a higher reliability (.94) between the two scale forms than the Thurstone method (.88). Likert found that the two scoring procedures were highly correlated (.92). From these results he concluded that a Likert item is essentially a scale in itself, the Likert and Thurstone scoring methods are equally valid, and that the Likert scoring of a scale will produce a higher reliability.

This assumption was further explored in a study by Likert, Roslow and Murphy (1934). The authors constructed Likert scales from ten twenty item Thurstone scales consisting of two parallel forms, for a total of twenty scales. In modifying the Thurstone scales to a Likert format some items on each of the scales were dropped

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because they were not suitable for a Likert scale (one to six items). The authors compared split-half reliabilities of each scale and reliabilities between parallel forms. Only once, out of twenty-seven comparisons, did the Thurstone method produce a reliability coefficient equal to the Likert method. The Thurstone method never produced a higher reliability coefficient.

Edwards and Kenney (1946) conducted a study where they compared Likert and Thurstone scales developed independently. They criticized earlier research stating that typically the items were obtained using the Thurstone technique then scored by either the Thurstone or Likert method. Thus, only the scoring methodology of the two techniques had been compared. This was essentially true except for the Likert internationalism scale and Thurstone-Droba war scale comparison (Likert, 1932). Edwards and Kenney presented the same pool of items to two separate groups of subjects about attitudes toward the church. One group (N=36) judged the items according to the Thurstone procedure while the other group (N=36) responded to the items in a Likert type format. Two Thurstone parallel scales (20 items in each scale) were constructed and a twenty-five item Likert scale. The scales were then administered to two groups of subjects (N=80) who either

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took the two Thurstone scales first and then the Likert scale or vice versa. The authors reported a split-half reliability of .94 for the Likert scale in comparison to a parallel-forms reliability of .88 for the Thurstone scales. From these results the authors concluded that "scales constructed by the Likert method will yield higher reliability coefficients with fewer items than scales constructed by the Thurstone method" (p. 82).

In the previously mentioned study by Barclay and Weaver (1962) the authors constructed two Thurstone and two Likert scales to measure attitudes toward Hawaii from a common pool of items. Each scale consisted of twenty-one items. The Thurstone scales were administered to 46 tourists and the Likert scales to twenty-nine students. The reliability between the two Thurstone scales was .66 and between the two Likert scales was .97. With the same number of items in the Thurstone and Likert scales the Likert's reliability was significantly higher.

Poppleton and Pilkington (1964) constructed two parallel Thurstone scales for measuring religious attitudes. The two scales were administered to sixty subjects who responded on a five point scale from strongly agree to strongly disagree. The items were then scored by the Thurstone method for the items endorsed and also

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by the Likert weighting method (responses weighted 1 through 5). The reliability between the two scales was .85 using the Thurstone scoring procedure and .95 using the Likert scoring procedure. The scores obtained by the two methods were then correlated with five church activities. The Likert scores correlated with four of the five church activities higher than the Thurstone scores although there were no significant differences. The authors concluded that although the reliability of the Thurstone scale was less than the Likert scale it was equally valid.

Ostrom (1969) was the first researcher to compare the Likert, Thurstone, Guttman and self-rating scaling techniques in the same study. The author employed a multitrait-multimethod matrix (Campbell and Fiske, 1959) design to examine the different scaling procedures and various attitude components toward the church. The scales were presented in booklet form to 369 university students. The author reported that the scaling procedures showed a high convergent but little discriminant validity.

The multitrait-multimethod matrix design was used by Rhoads and Landy (1973) to examine what they described as the two most common attitude scaling procedures--Thurstone and Likert. The authors developed four attitudes

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scales with twenty-four items in each scale. A Thurstone and a Likert scale were developed from a common pool of items to measure attitudes toward Psychology. A Thurstone and a Likert scale were also developed from another common pool of items to measure attitudes toward testing. Seven groups of union workers ($N=211$) were administered the four scales. The split-half reliability for the Thurstone attitude toward psychology scale was .81 and for the Likert attitude toward psychology scale was .95. The split-half reliability for the Thurstone attitude toward testing was .84 and for the Likert attitude toward testing was .92. Both the Thurstone and Likert scores were highly correlated for each attitude. The authors interpreted this as evidence for convergent validity of the two methods. The two Likert and two Thurstone scales supposedly measuring different attitudes were highly correlated. These findings suggest little discriminant validity for either method. Neither the Likert or Thurstone scale was superior in distinguishing between the various groups although all scales significantly discriminated between the groups.

More recently, the multitrait-multimethod was utilized to compare the Thurstone, Likert, Guilford's self-rating, and semantic differential techniques of attitude assessment (Jaccard, Weber and Lundmark, 1975). Two scales were

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developed by each technique to measure two attitude objects (smoking and capital punishment). The four scales on the two attitudes were administered to thirty-five students. The scales were administered twice with a seven day interval to obtain a test-retest reliability coefficient. Test-retest reliabilities for the smoking scales were .84 Semantic Differential, .89 Likert, .87 Thurstone, and .91 Guilford's self rating. Test-retest for the capital punishment scales were .85 Semantic Differential, .94 Likert, .88 Thurstone and .93 Guilford's self rating. The authors concluded from these results that the four methods were equally reliable. Unfortunately, the same number of items in each scale were not used which casts some doubt on the conclusion reached by the authors. A larger number of items was used in the Semantic Differential and Thurstone scales than the Likert scales which is clearly an advantage to those scales. Interestingly the Guilford self rating scale consisted of only one item. The very high test-retest reliability coefficients on the one item Guilford scales after only seven days is not too surprising. It seems legitimate to question whether or not the Guilford self rating reliabilities were inflated because of the subjects remembering their response to two one-item scales.

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The authors did find that the four methods were all highly correlated when measuring attitudes toward smoking and also when measuring attitudes toward capital punishment. The authors interpret these results to suggest that the four methods have high convergent validity. The results of the scales developed by the four methods were correlated with its same method for the two attitude objects i.e., Semantic Differential smoking scale results correlated with Semantic Differential capital punishment scale results, etc. The low correlations obtained between the same method-different attitude objects for the four methods were interpreted by the authors as demonstrating discriminant validity for the four methods. The convergent and discriminant validity coefficients suggest that there is little difference between the four attitude measurement techniques.

From the review of the literature it appears that the various scaling methods show a high degree of convergent validity. In other words, the various scaling methods are about equal in measuring a given construct. Demonstration of discriminant validity is sparse. No scaling procedure has been shown to be superior to another in this respect. It does appear that the Likert method of scoring a scale will consistently produce more reliable results than other scaling procedures with an equal number of items. This was

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the primary reason for using the Likert scaling format in the present study.

As previously mentioned, the major flaw of Templer's DAS is in its true-false format being a short scale. The Likert technique offers advantages over adding a number of items to the test to increase reliability. The items are homogeneous in nature and the task of adding many new items seems prohibitive. Masters (1974) has demonstrated that the reliability of homogeneous scales may be substantially increased by using the Likert technique with several response categories. Using the Likert technique does not exhaust the possibility of adding new items. If the coefficient alpha does not prove to be in the high .80's, the scale should not be considered reliable (internally consistent) and new items should be added (Crano and Brewer, 1971).

In the present study, a seven point scale was chosen over the more commonly used five point scale for two related reasons. Extreme responses are rarely chosen (Kleinmuntz, 1968) and reliability increased with each option added in increasing scale length from two to seven points (Remmers, 1972; Masters, 1974).

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Symonds (1924) advocated the use of a seven point scale. He implied that optimal reliability can be obtained with a seven point scale and if more than seven categories are used the increase in reliability would be so small it would hardly be worth the effort. Champney and Marshall (1939) argued for scales with up to eighteen to twenty-four steps for each item. This idea has received little attention in the literature. Remmers and Ewart (1941) suggested that reliability increases could be predicted as a function of increased number of categories by use of the Spearman-Brown formula. Some writers have contended that reliability of Likert scales is little affected by the number of response categories (Bendig, 1954; Matell and Jacoby, 1971). It appears to be generally accepted that the reliability of a scale increased, within limits, as the number of response categories increase (Guilford, 1954; Jahoda, Deutsch and Cook, 1951; Remmers, 1972 and Masters, 1974).

Several writers have used the term coarse in describing scales with too few response categories (Garner and Hake, 1951; Komorita and Graham, 1965). These researchers state that the use of a few response categories results in a loss of discriminative power that the raters are capable of making. This is the major

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flaw in Templer's true-false scale which only provides two response categories. Therefore, increasing the number of response categories via the Likert scoring method will result in a scale with greater discriminative power and higher reliability.

Of the scaling methods, the Likert approach seems to be the most useful in behavioral research (Kerlinger, 1973). Nunnally (1967) in discussing Likert scales states that they "have a number of attractive advantages over all other methods: (1) follow from an appealing model, (2) are rather easy to construct, (3) usually are highly reliable, (4) can be adapted to the measurement of many different kinds of attitudes, and (5) have produced meaningful results in many studies to date." (p. 531).

Crano and Brewer (1971) state that the Likert approach "represents currently the most popular approach to the generation of reliable attitude measurement devices. When compared with either the Thurstone or the Guttman method, Likert's scale construction technique typitifes a process that is not only more efficient in terms of resource expenditure but also more effective in developing scales of high reliability (in both the internal consistency and the temporal stability sense of the word)" (p. 23). In the present study, it is hypothesized that a

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Likert version of the DAS will result in an acceptable level of internal consistency and improve upon test-retest reliability.

In the new scales, subjects are asked to respond how they feel about a statement by choosing from seven categories of response. Disagree-Agree response categories (Thorndike, 1971) were chosen as they were most appropriate to match with Templer's item stems. A slight modification was made in the categories of response. Instead of Undecided for the mid-value category of response, Neutral was chosen. A separate Undecided response category below the scale was offered. The following is an example of the Likert scaling used in the present study:

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
____ Undecided						

The use of Neutral as a mid-scale value and a separate category for Undecided is based on a suggestion by McCarrey (1976). If a scale offers Undecided as a mid-scale value, responses made to it are questionable in interpretation. It can mean that the person is halfway between very strongly disagree and very strongly agree, but it can also mean that the person is absolutely intensely combining agreement and disagreement in their perception. "If a box off the scale

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is for Undecided with Neutral in the scale, then you know that Neutral is being used the way you want it" (McCarrey, 1976). The utility and significance of a neutral point on a Likert scale has recently been demonstrated by Guy and Norvell (1977).

The example presented illustrates the graphic method of Likert scaling (Thorndike and Hagen, 1961). This method offers advantages over Templer's true-false format. It is assumed that the probability of agreeing response tendency is reduced and the individual completing the Likert format is forced to attend more closely to each item.

The individual completing the Likert format is forced to attend more closely to each item for two reasons. The structural properties of the scale demand greater attention. Each item is set off from the next by the Likert scale following it. The second reason involves the categories of response. For one item the scaling may begin with very strongly disagree and proceed to very strongly agree and for the next item it may begin with very strongly agree and proceed to very strongly disagree.

In scoring the scale, the response to a scale option for each item is assigned a number from one to seven. The directionality of the question determines whether the extreme option at one end of a scale receives a one and the

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other extreme option receives a seven or vice versa. In the current project, the higher the number the greater death anxiety assigned to the item. A subject's death anxiety is assumed to be reflected by the summated score of all the items.

Scores for Undecided responses are assigned by substituting the mean rounded off to the nearest whole number for an item not answered with an Undecided response. The following is an example of the scoring procedure for Undecided responses: An individual responds to two items with an Undecided response. The summated score for the other thirteen items is 68. The average item score is 5.2. The Undecided responses are assigned a value of five and the summated scale score for this individual is 78.

The second method chosen of improving upon Templer's scale involves changing the fifteen item stems. The wording of the stems was changed to a greater intensity level i.e., higher fear appeal. This is based on the premise that an item stem with a higher fear appeal might be a more sensitive, i.e. discriminative, death anxiety measure. This procedure in the present project is used in a tentative or exploratory fashion. This was done by changing qualifiers and making the stems personal. Examples of how qualifiers were changed: "not particularly afraid" was changed to "scares me greatly". The item stems were made more personal by changing "thought of death" to "thought of my death" and "people talk about

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death" to "talk about my death". The new stems and the originals from which they were developed are presented in Table 3 on the following page. The second Likert scale with changed stems (LB Scale) is presented in the appendix.

The decision to change the stems to a greater intensity level i.e., high fear appeal developed from Higbee's review of research on fear arousal. A classic study in the effectiveness of fear arousing appeals was conducted by Janis and Feshback (1953). High-school students were exposed to tooth care demonstrations. The students were divided into one of four groups; strong, moderate, minimal fear groups and a control group. The intensity of fear was varied in the demonstrations. The authors concluded from this study that the minimal fear appeal was most effective in getting the students to change their habits.

This conclusion was diametrically opposed by Leventhal, Singer and Jones (1965). They examined how willing subjects were to obtain a tetanus shot after being exposed to fear-arousing appeals of different intensities. The authors state, in contrast to Janis and Feshback, "the communication which arouses more fear will be more persuasive" (p. 20).

The research in the area of fear arousing appeals has often produced conflicting results. The choice of using high fear intensity items in the present project, however,




Table 3
Comparison of Templer's Item Stems and Their
Modifications in the Present Study

-
- 1) I am very much afraid to die.
I am extremely afraid to die.
 - 2) The thought of death seldom enters my mind.
The thought of my own death never enters my mind.
 - 3) It doesn't make me nervous when people talk about death.
To talk about my death would not bother me at all.
 - 4) I dread to think about having to have an operation.
I would be extremely fearful to have a serious operation.
 - 5) I am not at all afraid to die.
I am looking forward to death.
 - 6) I am not particularly afraid of getting cancer.
I am not terrified of getting cancer.
 - 7) The thought of death never bothers me.
The thought of my death does not bother me.
 - 8) I am often distressed by the way time flies so rapidly.
I am frightened by the way life races by.
 - 9) I fear dying a painful death.
I am greatly afraid of dying a painful death.
 - 10) The subject of life after death troubles me greatly.
The subject of life after death scares me greatly.
 - 11) I am really scared of having a heart attack.
I am terrified of having a heart attack.
 - 12) I often think about how short life really is.
Death will come too soon to me.
 - 13) I shudder when I hear people talking about World War III.
I am terrified of being involved in World War III.
 - 14) The sight of a dead body is horrifying to me.
I could not touch a dead body.
 - 15) I feel the future holds nothing for me to fear.
There is nothing in the future for me.

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is a sound one. Higbee (1969), in his review of fifteen years of research on fear arousal and threat appeals, states the following:

The widely cited conclusion that high fear arousal creates a defensive-avoidance reaction which causes high threat to be less persuasive than low threat is not true in most situations. Most relevant research has indicated that high threat is superior to low threat in persuasion. (p. 441)

Validation of Likert Scales

The Likert scales, once developed, need to be proven to be related to the construct of death anxiety. This section examines the validation process used in the current project. Although there are several terms used in conjunction with validity, it is traditionally recognized that there are four interdependent kinds of validity: content validity, construct validity and criterion related validities (predictive and concurrent) (American Psychological Association, 1974). The approaches used to validate the Likert scales in these areas will now be presented.

Content Validity

Since the Likert scales represent modifications of Templer's original scale it can be said that the Likert versions contain a representative collection of items and

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the scales were developed following sensible methods of test construction satisfying Nunnally's (1967) criteria for content validity. This can be stated because Templer's scale appears to satisfy these criteria and the modifications proposed should result in an improvement in the scale.

As previously stated, Nunnally's criteria are meager. Demonstration of the content validity of a scale can be obtained through circumstantial evidence. In the present study, circumstantial evidence for the content validity of the Likert scales, as well as Templer's original scale, will be obtained by considering construct, convergent, discriminant and concurrent validity data, internal consistency estimates of reliability, and the factorial composition of the scales.

Construct, Convergent and Discriminant Validity

Evidence for the construct validity of the Likert scales will be obtained by four methods. First, the Likert scales will be correlated with variables previously demonstrated to be related to Templer's scale. Assuming Templer's scale measures the construct of death anxiety, which it appears to, evidence for the Likert scales' validity will be obtained if the predicted correlations occur between the Likert scales and the variables shown to be related to Templer's scale. Evidence for the construct validity of the Likert scales will also be

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obtained if it can be demonstrated that the scales have convergent and discriminant validity. The final procedure for exploring the construct validity of the Likert scales involves the use of factor analysis. These four methods will now be discussed in the context of this experiment.

The variables of sex, religiosity and the Marlowe-Crowne Scale were chosen to be correlated with the Likert Scales in an attempt to establish construct validity of the new scales. A consideration of these variables and their relationship to death anxiety as measured by the DAS will now be presented.

The variables of sex, as significantly related to death anxiety, has received considerable support. Lester (1967) has presented an extensive review of the literature. Studies suggest that females are more fearful of death. Research conducted with the DAS has supported this suggestion. Females consistently obtained higher scores than males in seven studies reported by Templer (1971). Numerous studies have demonstrated that females tend to score higher on the DAS than males (Pandey and Templer, 1972; Berman and Hays, 1973; Lucas, 1974; Brown, 1975; Klug, 1976; Schultz, 1976 and McDonald, 1976).

In the process of construct validation it must be demonstrated that the Likert scales are sensitive to the sex difference. If the Likert scales are better than

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Templer's scale, the sex difference should reach a higher level of significance. The Likert scales should establish more clearly the female higher than male relationship. A hypothesis will test this assumption.

The relationship of religiosity to death anxiety is not as clearly established as the female-male relationship. It is a widely held belief that religious variables should be related to death anxiety and it is generally assumed that the more religious individual will exhibit less death anxiety and vice versa (Templer and Dotson, 1970). The results of several studies, however, have produced conflicting results (Templer and Dotson, 1970; Templer, 1972; McCarthy, 1975; Templer and Ruff, 1975; McDonald, 1976; Bascue and Lawrence, 1977; Liang, Kahona and Tagore, 1977).

Templer has ventured possible explanations for the discrepancy he found in his research. Templer suggested three possibilities: 1) religion may not be very important to most college students; 2) strength of one's belief is more crucial than content; 3) strong religious faith and low death anxiety is a function of other personality characteristics (Templer, 1972).

The variable of religiosity was included in the present project to examine this problem more closely. Any significant results offer the advantage of a needed theoretical as well as an empirical contribution. In

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previous studies, there was no measure of self-perceived religiousness.

The concept of a person's religiousness being determined by one's perception is well supported in philosophical, religious and psychological literature. The consensus of opinion from the three schools of thought very much favor a personal definition of religion for the individual.

Hartshorne and Reese (1953) in their book Philosophers Speak of God show that "religiosity is defined by the person" is a common theme in philosophy. To cite only a few examples: Pascal believed that man must see for himself his relationship to religion and religious feeling can be independent of understanding (Avey, 1961); the agnostic T.H. Huxley stated that one is morally entitled to entertain a belief system which can be justified logically (Castell 1963); Pratt equated religion with subjective perception (Avey, 1961); Marcel (1948) said that religion can only be understood by intersubjectivity; Tillich (1959) stated that God is personal and Ayer (1973) claims that religiousness is a cognitive act.

Van Der Leeuw (1963) in summing up the religious literature states that everything in religion is personal and religion can be observed as intelligible experience. He observed that "God" is frequently an extremely indefinite concept and religious experience is concerned with a "somewhat". Subjectively the individual defines these concepts for himself. A person can decide or alter his attitude. Haskins (1973) stated that it is hard to define religion and that ten

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different people would give ten different answers. Each of the answers would reflect how the individual defines religion for himself.

Douglas (1966) points out that there have been methodological problems in trying to measure religiosity. The use of reported religious practices, for example prayer, and behavioral data supposedly related to "religion" resulted in according to Douglas a failure of researchers to get at the basic issue. Tillyard (1927) demonstrated that subjects who approached meditational exercises with the purpose of obtaining a deeper religious experience perceived that they obtained such an experience in contrast to those who had no such expectation. Pahnke (1963) administered either psilocybin or placebo to divinity students prior to a religious occasion. The students reported experiences that varied greatly which led the author to conclude that what one religiously feels is a function of what one expects or intends to feel.

The theoretical writings in psychology reflect that one's religiosity is often defined by the individual. Although a thorough analysis of literature in this area is beyond the scope of this presentation a few examples will be cited. William James is frequently recognized as the first psychologist to have a major impact in the examination of religiousness. James (1902) adopted the position that even if evidence is insufficient to justify a belief system on rational grounds, the individual still has the right to believe. He further

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stated that the view taken by a person which seems to that person to be more satisfactory morally will be treated as truer (it is interesting to note that other writers have noted that this statement can be used to support a theistic or atheistic position). Clearly, the position taken by James is that an individual's religiosity is determined by the individual's perception. Allport (1960) distinguished between extrinsic and intrinsic religion. Intrinsic religion is more of a "religious" life style the individual chooses for himself to live by. Lenoki (1961) stated that there are two types of religious commitments. The first type of religious commitment is to a socio-religious group. The second type of commitment is to a religious orientation that transcends socio-religious group lines. These writers along with several others, most notably Fromm, May and Mowrer, emphasize the importance of the person's perception in the determination of his religiousness.

Based upon the theoretical writings in the area of philosophy, religion and psychology there appears to be ample justification for self-ratings of religiosity. In the present study, the strength of self-perceived religiosity will be measured by a self-report checklist. The individual's religious belief system will also be

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ascertained. The measurement of these variables will be explained in more detail in the next chapter.

The construct validation process using the religiosity variable is based on theoretical contentions rather than a previously established empirical relationship with the DAS. Several writers have contended that the strength of one's convictions in being religious or even non-religious is the important determinant in one's fear of death (Alexander and Adlerstein, 1958; Feifel, 1960; Osarchuk and Tatz, 1973). Hence, it is likely that the devout religious person and the devout non-religious person, in terms of their own self-perceptions, will show low death anxiety. Individuals between these two extremes are likely to exhibit higher death anxiety. In the process of construct validation, it must be demonstrated that the Likert scales are able to demonstrate this relationship as well as the DAS.

The third variable chosen to demonstrate construct validity is the Marlowe-Crowne Scale. The tendency to respond in a socially desirable direction, as measured by the Marlowe-Crowne Scale, has been shown not to be related to the DAS (Templer, 1970). If the Likert scales are superior to the DAS, it must be demonstrated that they are less susceptible to social desirability than the DAS. The Marlowe-Crowne, as a measure of social desirability, will be presented in the next chapter.

Evidence for the convergent validity of the Likert scales will be explored by correlating the Likert scores

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with scores on Templer's scale. If the Likert scales show high correlations with the Templer scale, it can be said that the measures converge i.e., show evidence of convergent validity (Campbell and Fiske, 1959).

In the process of discriminant validation, it must be demonstrated that the Likert scales are not related with other measures from which they were intended to differ (Campbell and Fiske, 1959). In the present study, the variables of self-perceived religiosity, as measured by a checklist and social desirability as measured by the Marlowe-Crowne, will be used to assess discriminant validity. These variables should not be too highly correlated with the Likert scales, as they are intended to measure different constructs. Evidence for the scale's discriminant validity will be shown if these results are obtained.

No hypothesis is made in the present study about convergent validity. It was the authors intent to propose hypotheses that could pit one scale against another. This is an impossible task when the DAS scale is being used as a criterion by which to demonstrate convergence of the two new scales. Therefore, the convergent validity of the scales is presented in chapter four in the section on parameters of the samples used in the two studies.

The final procedure used to evaluate construct validity is factor analysis. Factor analysis has been called the "queen of analytic methods" because of its

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"power and elegance" (Kerlinger, 1973). Most of the research on test validity involves the use of factor analysis (Thorndike, 1971). Generally stated, the technique of factor analysis helps to clarify what the scale or test measures.

In the present project, factor analysis will be used to provide evidence for the construct validity of the Likert scales and demonstrate their advantage over the DAS scale. Using the scores from the similar death anxiety scales in a factor analysis, a primary factor, which could be called a death anxiety factor, will be found. The advantage of the Likert scales will be demonstrated if their factor loadings are significantly higher on this factor than that of the DAS scale. In the factor analyses of the items of the scales used together in the same analysis, it is assumed a primary death anxiety factor will be found. Evidence for advantage of the Likert items will be found if they load more items on this factor, i.e., define this factor better.

Criterion Related Validity

The approach taken to demonstrate criterion related validity of the Likert scales was by means of concurrent validity. Concurrent validity is a criterion related validity that reflects the "status quo" at the time the data was obtained and can be used to estimate a subject's present standing on some criterion variable (APA, 1974).

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In the first study, the results from Templer's scale will serve as the criterion to demonstrate concurrent validity. The concurrent validity will be examined by comparing the ability of the items of each scale to discriminate between high and low scores on each scale. It is assumed that the three scales are measuring the same construct. Therefore, concurrent validity can be demonstrated if items of the three scales administered at the same time discriminate in a similar manner. Furthermore, the advantage of the Likert items will be demonstrated if a significant number of items have higher discrimination point-biserial correlation estimates than similar DAS items.

The concurrent validation process used in the first study does have a serious limitation. No external criterion of the construct the new scale is supposed to measure is used. Validating a new scale with an external criterion of the construct it is supposed to measure, is a necessary next step in the validation process (Campbell and Fiske, 1959). The second study fulfills this need by introducing an external criterion.

Concurrent validity will be examined in the second study by creating two scenarios. The scenarios will be presented in greater detail in the next chapter. Two groups will be used. One group will be exposed to a neutral situation and asked to complete the DAS and a Likert scale as if they were the person in that situation. The second group, given the same instructions, will be exposed to a

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death salient situation.

The purpose of the second study is to demonstrate that the Likert scale does have concurrent validity and that it is better in this respect over Templer's DAS instrument. It is assumed that the experimental manipulation of the scenarios will result in a significantly higher mean death anxiety score for the subjects in the death salient scenario on the DAS and LA scales. The advantage of the Likert scale will be demonstrated if it is able to discriminate between subjects of the two scenarios better than the DAS scale.

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Presentation of Hypotheses

The essential focus of the present study is that the current "best" measure of death anxiety (Templer's DAS scale) suffers from a number of flaws and the present study is directed toward development of a better scale. Two methods were adopted to improve the scale. The first involved using a Likert format instead of a true-false format (LA). The second attempt at improving the scale involved changing the item stems while retaining the Likert format (LB).

The hypotheses deal with weaknesses of the DAS scale that need to be improved upon. The intent of the hypotheses is to pit one scale against another and demonstrate the superiority of the LA and LB scales over the DAS scale.

Hypotheses

1. There is no significant difference among the DAS, LA, LB scales of death anxiety for internal consistency estimates of reliability and test-retest reliability.

Expectations: Reliability measures of internal consistency and test-retest stability will be improved (i.e., higher) over the DAS scale when a Likert format is used. Likert B will show higher reliability coefficients than Likert A.

2. There is no significant difference among the DAS, LA, LB scales of death anxiety and their correlations with

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the Marlowe-Crowne Scale.

Expectations: Construct validity will be improved using a Likert format. The LB scale will show a more dissimilar relationship to the Marlowe-Crowne than the LA scale (the LA scale's relationship being more dissimilar to the Marlowe-Crowne than the DAS scale).

3. There is no significant difference among the DAS, LA, LB scales of death anxiety in their factor loadings on the primary factor of death anxiety and among the number of items from each scale loading on the primary factor of death anxiety.

Expectations: The LB scale will have the highest factor loading and the DAS scale will have the lowest factor loading. More LB items will load on the primary factor of death anxiety than DAS or LA items. More LA items will load on this factor than DAS items.

4. There is no significant difference among the DAS, LA, LB scales of death anxiety for males and females.

Expectations: Construct validity will be improved using a Likert format. The Likert scales will be able to make better discriminations between sexes (i.e., females higher than males in death anxiety) than the DAS scale. The LB scale will be able to make better

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discriminations than the LA scale.

5. There is no significant difference among the DAS, LA, LB scales of death anxiety for self-perceived religiosity.

Expectations: Construct validity will be improved using a Likert format. The Likert scales will be able to make better discriminations between high, medium and low self-perceived religiosity (i.e., highs and lows showing less death anxiety than mediums) than the DAS scale. The LB scale will be able to make better discrimination than the LA scale.

6. There is no significant difference among the DAS, LA, LB scales of death anxiety in the discriminability of their items.

Expectations: The LB scale will have more items of discriminability with greater correlations than the LA scale or DAS scale. The LA scale will be superior to the DAS scale in this respect.

The following chapter will present the experimental design used in the two studies of this research project.

CHAPTER III

EXPERIMENTAL DESIGN

Chapter III consists of three sections. The first two sections present the two studies conducted in the current project. The subjects, measuring instruments, testing sequence and procedure for each study are presented. The chapter concludes with a discussion of the statistical analysis used to test the hypothesis.

The First Study

Subjects

The subjects for the first study were obtained from undergraduate Psychology courses with permission from the students and their instructors. A sample size of 320 subjects (200 females, 120 males) participated in the first testing session. Six classes participated in the study with sample sizes of 30, 44, 50, 51, 61, and 84 subjects. In the retest testing session, data was obtained for 281 subjects (178 females, 103 males) of the original sample. The subjects ranged in age from seventeen to forty-four with a mean age of 22.44 years for the total sample.

Many critics of psychological experiments have argued that the college student is perhaps the poorest choice possible from the viewpoint of generalization of findings (Barclay, Crano, Thornton and Werner, 1971). Campbell and

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Stanley (1963) argued that the development of a psychology of the college student or any other esoteric group is better than no psychology at all. The authors suggest that principles of behavior once determined from a restricted population can then be applied selectively to other groups in order to test whether subject characteristics limit their generalizability.

The use of the college student in the present study is a sound one. The college population insures a degree of homogeneity with reference to educational level. Subjects, for the most part, are similar ages. Importantly, the DAS used in this research was originally developed from studies with college populations. Sidman (1960) has emphasized the importance of replication of instruments with a given population to establish the generality of a phenomena amongst the subjects tested.

Instruments of the Study

Death Anxiety Measures. Three measures of death anxiety were used in the present study. They have been presented in previous chapters and will be only briefly described here. Templer's (DAS) fifteen item true-false scale was chosen as it is the best available instrument. Templer's instrument was used in the present study as a criterion from which to develop a better measure of death anxiety. The two other scales used in the present study were developed by this

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writer to improve upon Templer's scale. The LA scale consists of Templer's original fifteen items responded to on a seven point Likert scale. The third measure of death anxiety used in the study was the LB scale. The LB scale was developed by changing Templer's item stems to a greater intensity level and responded to on a seven point Likert scale.

Marlowe-Crowne Scale. The Marlowe-Crowne Scale was developed by Crowne and Marlowe (1960) to measure social desirability. Social desirability is defined by the authors as "a need for social approval and acceptance and the belief that this can be obtained by means of culturally acceptable and appropriate behavior" (Marlowe and Crowne, 1961, p. 109).

The scale consists of thirty-three true-false items. Roughly half of the items deal with socially acceptable behavior that is relatively unlikely to occur. The remaining items deal with socially unacceptable behavior that is likely to occur frequently. The authors report a one month test-retest reliability of .89 and an internal reliability of .88. The Marlowe-Crowne Scale has been demonstrated to be related to other measures of social desirability i.e., Edwards Social Desirability Scale and MMPI subscales. The authors conclude that the Marlowe-Crowne is functionally equivalent with other measures of

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social desirability (Crowne and Marlowe, 1960).

The scale measures the tendency of individuals to select socially desirable answers. In attitude measurement, individuals are frequently asked for their self-report on values, behavior, beliefs, etc. It may be that the individual's opinion is at variance with social norms. Under these circumstances, an individual may not respond the way he/she truly feels. The individual may be tempted to respond to the attitude measuring instrument in a more socially acceptable manner (Crowne and Marlowe, 1964).

The Marlowe-Crowne Scale has been used in a wide variety of research areas. As a measure of social desirability it appears more than adequate for most research purposes. Schwartz and Giacoman (1972) used a multitrait-multimethod matrix approach to examine three measures of social desirability and adjustment. The construct validity of the Marlowe-Crowne Scale was supported in a principal-components analysis. Scherer (1974) stated that several studies had clearly demonstrated that the Marlowe-Crowne Scale was related to self-acceptance. There is general agreement that the Marlowe-Crowne Scale measures "need for social approval" (Strahan and Wilson, 1976, p. 320) and "the willful tendency to lie or 'fake good'" (Kestenbaum, 1976, p. 306). There is general agreement in the literature that the Marlowe-Crowne Scale is basically a reliable and

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valid instrument.

General Information and Survey. The general information and survey page were developed by this writer to fit the needs of the present study. The general information page consisted of four questions designed to provide some background information on the respondents.

The respondents were asked their sex, age, and religion. The fourth question dealt with self-perceived religiosity. A six point checklist was provided so that the respondents could rate themselves on the following categories: extremely religious, very religious, somewhat religious, slightly religious, not at all religious, and antireligious. An a priori scoring system was determined by combining respondents to either of the first two categories and calling them high in terms of self-perceived religiosity. Respondents who chose either of the last two categories were designated low in religiosity. Respondents who chose either the third or fourth category were designed medium in religiosity.

The survey page was designed to obtain feedback from the respondents. The respondents were asked to report their self-perceptions in a free response format. Four questions were asked and a space for comments was provided. The questions sought responses to whether the individuals had answered truthfully, how they felt about the questionnaire, whether it was upsetting, and had they done any thinking about

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the questions since they had originally taken the instrument.

Of the instruments presented, only the three death anxiety measures were administered in both the initial and retest sessions. The Marlowe-Crowne Scale and general information page were administered during the initial session. The survey page was administered in the retest session. The instructions used were standard instructions recommended by the author for each instrument used. The instruments used in this study are presented in Appendix A.

Method

Testing Sequence. As part of the experimental design, in order to control for certain potential problems that would cloud the interpretation, all possible sequences of the three death anxiety measures were utilized. The counterbalancing resulted in six testing sequences. The Marlowe-Crowne Scale was administered after the three death anxiety measures so it would not affect responses made to those scales. The sequence of testing was assured by stapling together the testing sequence in the order to be completed. The number and percentage of subjects in each testing sequences are presented in Table 4 on the following page.

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Table 4
Testing Sequence

<u>Test Sequence</u>	<u>N</u>	<u>Relative Frequency (Percent)</u>
DAS - LA - LB	55	17.2
DAS - LB - LA	55	17.2
LA - DAS - LB	52	16.2
LA - LB - DAS	51	15.9
LB - LA - DAS	53	16.6
LB - DAS - LA	54	16.9

Procedure. Several professors teaching Introductory and/or Developmental Psychology courses were contacted to see if they would be willing to relinquish class time and allow their students to participate in the study. One professor volunteered her class and four other professors agreed after being contacted. One professor offered two of his classes.

The professors were asked to inform the students as to the possibility of participating on a voluntary basis in a doctoral research project. Arrangements were made to enter the classroom during the regular class meetings at the professor's convenience. The only stipulation made was that the classes could be retested three weeks from the initial testing session. The professors were informed that the testing sessions would take approximately forty minutes.

Prior to the initial testing, the students received general information. They were informed that the

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project was a doctoral research study in Clinical Psychology. They would be asked to complete a questionnaire. Before going any further with any explanations, it was made clear that participating was strictly on a voluntary basis. This information was followed by an introductory statement as follows:

I would like to take this opportunity to thank you for participating in my research project. I really appreciate it. I won't say too much about it now as it might affect the results. I will be happy to discuss it later with you.

It will not take very long to complete the questionnaire. I think you will find the exercise interesting and enjoyable. I would like you to cooperate in an honest and sincere manner.

Some individuals on occasion have found the questionnaire to be upsetting. If that is the case for you, you are under no obligation to complete the questionnaire.

Now, having heard all the instructions, is there anyone who does not want to participate?

A brief pause was introduced to allow students to leave who did not wish to continue. No student left in any of the six classes at this time. The subjects were told they would be filling out a series of questionnaires to be completed in order of appearance within the testing packet.

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It was explained that the questionnaires were of the true-false and Likert variety. The class was asked as a whole if they had any experience in responding to scales. In two classes a sample true-false and Likert response were presented on the blackboard.

Volunteers were asked to distribute the testing packets. The testing packet consisted of a 9 by 12-inch blank manilla envelope containing one of the six possible sequence of tests. One of the six test sequences was randomly assigned to each student in the six classes. This was assured by a random collating of testing packets prior to distribution to the classes.

After everyone had received a testing packet, the instructions were resumed:

Please place your name on your envelope. This will enable me to distribute material to you upon our next meeting. I assure you that your results will be anonymous. In the envelope you will find the questionnaire to be completed today.

The instructions for the questionnaire are written on the questionnaire. Should you have any questions, please raise your hand and I will assist you. Once again, thank you for your help. I will be returning to your class in the near future to complete the project. Are there any questions?

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Following the testing session, the students were asked not to discuss the session with others who are not in the class. The rationale underlying this necessity was shared with the class.

Three weeks after the initial testing session, the students in the six classes were administered a retest. The three week time period to assess test-retest reliability was modeled after Templer's research (Templer, 1970). The manilla envelopes with the student's name on them enabled the researcher to make sure that each student received the same testing sequence in the retest session that he/she originally completed. The testing packets had been prearranged in alphabetical order to facilitate the speed in handing them out. The student's names were read from the manilla envelopes and their testing packet passed to them. A general debriefing followed in those classes where time permitted.

The Second Study

Subjects

The subjects for the second study were obtained from undergraduate and graduate Psychology courses at Ottawa and St. Paul University. Two undergraduate and one graduate class were obtained from Ottawa University and one undergraduate and graduate class from St. Paul University. A sample size of 121 subjects participated in the second study (64 females, 57 males). The five classes had sample sizes of 16, 18, 24, 26 and 37 subjects.

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Instruments of the Study

Death Anxiety Measures. Two measures of death anxiety were used in the present study. The LA scale, which proved to be as good as the LB scale in the first study, was chosen to be used in the present study. The LA scale uses Templer's items in a Likert scaling format. Templer's DAS was also administered. Both instruments have been previously described.

Cover Page and Scenarios. A cover page and two scenarios had been developed by this writer. The cover page was designed to establish an appropriate "mental set" for the experiment and prepare the respondents for their role-playing behavior. The cover page used in the present study is presented on the following page.

The cover page consists of three basic parts. The reader is briefly informed, in the first two paragraphs, that the study is about how individuals form judgements about people. The third paragraph attempts to establish the "mental set" for role-playing behavior. The reader is informed that a person will be described on the next page. The reader is instructed to pretend i.e., role-play that he or she is that person. The third part of the cover page informs the reader that they will be asked to respond to a questionnaire. The responses the readers make are to be those they believe the person described in the scenario

COVER PAGE

We at the faculty of Psychology are presently doing research on the way people form judgements about themselves and others.

In interacting with others we frequently make judgements concerning others. Sometimes we use direct observation while in other cases our information comes from indirect sources. This experiment is of the latter, indirect observation.

On the following page you will find a particular situation concerning a focal person described in some detail. We would ask you to role play the feelings and responses that you would make were you actually the person in the described situation. After reading the following page you will be asked to make certain judgements and answer some questions.

Remember to make these judgements and answer these questions as though you were the person described in the situation. Do not spend too much time on any one judgement. It is your first impressions that we are interested in.

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would make.

Two scenarios were developed by this writer. One scenario is labeled a neutral scenario and the other is a death anxiety scenario. They were purposefully designed to be structurally and grammatically equivalent as possible except for key wording. The key wording in both scenarios establishes the experimental manipulation.

In both scenarios the individual has applied to a counselor for help. In the neutral scenario, the focal person has an adjustment problem with a new boss. In the death anxiety scenario, the wording is changed. The person has just found out that he/she has a terminal illness and is afraid to die. In the second paragraph, the same general background information is provided in both scenarios. The paragraph concludes with the focal person in a relatively happy position (neutral scenario) or in a relatively anxious position (death anxiety scenario).

Next, the reader is informed that the focal person enjoys being with and helping people (neutral scenario). In the death salient scenario the focal person once almost lost his/her life and has been afraid of death every since. Both scenarios report the focal person was shocked when he/she had trouble getting along with the boss (neutral scenario) or found out that he/she would soon die (death anxiety scenario).

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The scenarios conclude with the same paragraph. The respondents are instructed to reply to the questionnaire as if they were this person. Presented on the following two pages are the neutral and death anxiety scenarios respectively.

The assumption that asking an individual to role-play a death salient scenario constitutes a measure of death anxiety appears valid. In the two scenarios, the focal person and the situation the focal person was in was described. In reviewing the literature on attribution research, Lindzey and Aronson (1968) state, "by combining cues derived from the person, on the one hand, and from the situation, on the other, one typically arrives at highly consensual and functional judgements in the great majority of ordinary situations" (p. 422). Pryor and Kriss (1976) demonstrated how information sets could produce highly stable attributional patterns.

In the process of attribution, "it is clear that most people, given some trait information about another person, generally go on to make inferences about a great variety of other traits not included in the data given" (Lindzey and Aronson, 1968, p. 423). Individuals asked to role-play a focal person typically respond in a manner they believe the focal person would respond in (Arkin, Gleason and Johnston, 1976; Bassili and Regan, 1977).

NEUTRAL SCENARIO

You have applied to a counselor for help. You have a slight adjustment problem with your new supervisor at work.

You are happily married with two children. You are generally cheerful and optimistic. You are considered to be a good hard worker by others. Basically you find yourself in a relatively happy position and feel good about yourself.

You enjoy being with people very much. Helping other people gives you much satisfaction and a sense of achievement.

It came as quite a shock when you recently found out that you had difficulty getting along with this person.

As part of the counselling you are given the following questionnaire to complete. Please reply to the questions as if you were this person.

DEATH ANXIETY SCENARIO

You have applied to a counselor for help. You have just learned that you have a terminal illness and you are afraid to die.

You are happily married with two children. You are generally cheerful and optimistic. You are considered to be a good hard worker by others. Basically you find yourself in a relatively anxious position concerning your impending death.

Several years ago you almost lost your life. Ever since then you have been afraid of the subject of death.

It came as quite a shock when you recently found out that you had a terminal illness that you would soon die from.

As part of the counselling you are given the following questionnaire to complete. Please reply to the questions as if you were this person.

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Method

Testing Sequence. To control for any possible order effect, the LA scale and DAS scale were used in all possible sequences. This resulted in two possible sequences, LA-DAS or DAS-LA, within each scenario.

Procedure. Several professors teaching psychology courses at Ottawa University and Saint Paul University were contacted to see if they would be willing to relinquish class time and allow their students to participate in the study. The time of year, with classes close to finishing, greatly diminished the availability of subjects for the study.

The professors were asked to inform the students that participation in the project was voluntary and that it was a doctoral research project. Arrangements were made to enter the class at the professor's convenience. It was made clear that it would take approximately thirty minutes to complete the study and debrief the subjects. One class, having already been frequented by this writer, was tested by a colleague.

Prior to the presentation of the scenarios, the students were informed that the project was a doctoral research project in Clinical Psychology. They would be asked to role-play a person and answer two brief questionnaires as if they were that person. It was made clear that participation in

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the project was on a voluntary basis and their help in the project would be most appreciated. This information was followed by an introductory statement as follows:

I would like to take this opportunity to thank you for participating in my research project. I really appreciate it. I won't say too much about it now as it might affect the results. I will give you some feedback when you have finished.

I am going to pass out two brief questionnaires I would like you to fill out. The instructions for the exercise are provided on the top page (pointed to top page). If the instructions are not clear, please ask me to explain them.

It will not take very long to complete the questionnaires. I think you will find the exercise interesting and enjoyable. Should you have any questions once you have started please raise your hand and I will assist you.

The scenario testing packets were randomly distributed. The two possible test sequence orders within the two scenarios had been randomly collated prior to distribution. Upon completion of the questionnaire, approximately fifteen minutes, the students were debriefed as to the experimental manipulation, purpose of the present study and previous findings. The students were asked not to discuss the

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experience with others and the rationale underlying this necessity was shared.

Statistical Treatment

In the present section, the hypotheses presented in Chapter II will be restated, followed by a description of the statistical techniques used to examine them. Many of the statistical procedures were chosen from programs in the Statistical Package for the Social Sciences, (SPSS, Nie, Hull, Jenkins, Steinbrenner and Bent, 1975).

Hypothesis 1.

There is no significant difference among the DAS, LA, LB scales of death anxiety for internal consistency estimates of reliability and test-retest reliability.

Internal consistency reliabilities were computed by use of the Cronbach Alpha formula. Testing for significant differences between correlations was accomplished by use of Fisher's Z transformation. Test-retest reliabilities were computed by use of the Pearson correlation formula (SPSS). A t-test (Downie and Heath, 1970, p. 234) was used to test for significant differences between correlations.

Hypothesis 2

There is no significant difference among the DAS, LA, LB scales of death anxiety and their correlations with the Marlowe-Crowne Scale.

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The correlations were computed by use of the Pearson correlation formula. A t-test was used to test for significant differences between correlations.

Hypothesis 3

There is no significant difference among the DAS, LA, LB scales of death anxiety in their factor loadings on the primary factor of death anxiety and among the number of items from each scale loading on the primary factor of death anxiety.

Five principal axes factor analysis programs were conducted (SPSS). The seven scales used in the first study were used in one analysis. The fifteen items of the three death anxiety scales were analyzed separately. The final analysis consisted of combining the fifteen items from the three death anxiety scales.

Hypothesis 4

There is no significant difference among the DAS, LA, LB scales of death anxiety for males and females.

Hypothesis 5

There is no significant difference among the DAS, LA, LB scales of death anxiety for self-perceived religiosity.

Hypothesis four and five were examined in a similar manner. A series of oneway analysis of variance procedures (SPSS) were conducted for each hypothesis. The death anxiety scale in each analysis was used as the dependent variable.

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For the fourth hypothesis, five separate two-group discriminant analyses were conducted. Five stepwise six-group multiple-discriminant analyses were computed for the fifth hypothesis (SPSS).

Hypothesis 6

There is no significant difference among the DAS, LA, LB scales of death anxiety in the discriminability of their items.

Using the results from the first study, the subjects were divided into high and low groups on each scale. Guilford's (1954) index of discrimination was then computed for each item of each scale. In the second study, two oneway analysis of variance procedures were computed. The death anxiety scale in each analysis was used as the dependent variable. Four separate two-group discriminant analyses were conducted.

The hypotheses posed are now presented in statistical null form with the criterion for statistical significance for each hypothesis. The number associated with the statistical terms, i.e., r, p, L, N, Fr, represent a particular scale or items of a particular scale. The number one is associated with the DAS, two with the LA and three with the LB scale or items.

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Hypothesis 1. Both the internal consistency and test-retest hypothesis can be stated in the same statistical null form, i.e., $r_1 = r_2 = r_3$. The term r represents a reliability coefficient. The criterion for demonstrating a significant difference is set at the .05 level.

Hypothesis 2. The hypothesis concerning the correlation of the Marlowe-Crowne Scale with the death anxiety scales can be expressed as $r_1 = r_2 = r_3$. The .05 level is used at the criterion for demonstrating significant differences.

Hypothesis 3. Given that L equals the factor loading of a scale on the primary factor of death anxiety, the first section of this hypothesis in null form is $L_1 = L_2 = L_3$. The loadings considered as correlations were tested for significant differences by use of a t -test. The second section of the hypothesis concerning the number of items loading on the primary factor of death anxiety in null form is expressed as $N_1 = N_2 = N_3$. The criterion selected for demonstrating a significant difference is two items. If a scale contributes two items more to the death anxiety factor, the items of that scale are considered superior in defining the primary factor of death anxiety.

Hypothesis 4 and 5. These hypotheses can be expressed in the same statistical null form. Given that F_r is associated with the F values obtained for the items of each

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scale in the discriminant analysis for any discriminant function, the hypotheses in statistical null form are $Fr_1 = Fr_2 = Fr_3$. The .05 level is used as the criterion for demonstrating significant differences.

Hypothesis 6. Hypothesis 6 was tested separately in two studies. Given that N equals the number of items with higher point-biserial correlation estimates obtained in the first study, this hypothesis can be expressed $N_1 = N_2 = N_3$. The criterion for demonstrating statistical significance is two-thirds of the items or ten items. If a scale has ten or more items with higher point-biserial correlation estimates than similar items of another scale, the items of the scale are considered superior in discriminating between high and low scores. The second study used a discriminant analysis approach.

Hypothesis 6 for the second study can be written in null form as $Fr_1 = Fr_2$. The .05 level is used as the criterion for demonstrating a significant difference.

This chapter presented the salient features of how this project was conducted. Design and methodological information of the two studies were provided. The following chapter presents the analysis of the data.

CHAPTER IV

PRESENTATION AND DISCUSSION OF RESULTS

The first section of this chapter presents the parameters for the samples of the two studies used to test the hypotheses. The second section presents the results of the statistical analysis. Each hypothesis is presented along with the statistical results and a brief discussion. The chapter concludes with a summary of the study and suggestions for further research.

Parameters for the Samples of the Two Studies

The parameters for the sample of the first study will be presented first, followed by the parameters of the second study.

In the first study, scores obtained on the DAS ranged from 0 to 15, with a mean of 6.86 and a standard deviation of 3.28. In the retest session, the range was from 0 to 15 with a mean of 6.45 and a standard deviation of 3.52. The range of scores for the LA scale was 24 to 105 with a mean of 59.88 and a standard deviation of 13.42. In the retest session, the range was from 16 to 95 with a mean of 57.89 and a standard deviation of 14.19. The LB scores ranged from 24 to 99 with a mean of 58.70 and a standard deviation of 12.94.

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In the retest session, the range was from 20 to 94 with a mean of 57.11 and a standard deviation of 13.19. Scores for the Marlowe-Crowne Scale ranged from 2 to 33 with a mean of 14.80 and a standard deviation of 5.77.

Table 5 presents the correlations of the five scales used in the study. Three scales are death anxiety measures (DAS, LA and LB) and two scales measure other constructs. The other two scales are the Marlowe-Crowne social desirability scale and the one item self-perceived religiosity scale. The main diagonal of the correlation table presents the test-retest correlation coefficients (data not obtained for Marlowe-Crowne and self-perceived religiosity). The test-retest coefficients should, ideally, set the upper limit for the correlation table, i.e., an attitude measure must correlate at least as highly with itself as it does with other measures (Campbell and Fiske, 1959). The high intercorrelations between the three death anxiety measures indicate a high degree of convergence of the scales i.e., convergent validity. The LA-DAS correlation is significantly higher than the LB-DAS correlation (using a T test for correlated data) which suggests that the LA scale converges with the DAS scale better than does the LB scale. Thus, it can be said that the LA scale was found in this study to possess a higher degree of convergent validity with the DAS scale than the LB scale.

TABLE 5

Correlations of three death anxiety scales (DAS, LA, LB), the Marlowe-Crowne Social Desirability Scale (MC) and the self-perceived religiosity checklist (REL).

	DAS	LA	LB	MC	REL
DAS	(.84)	.85	.77	-.21	.07
LA		(.85)	.86	-.24	.05
LB			(.87)	-.23	-.01
MC				()	.07
REL					()

Correlations greater than .20 are significant,
 $p < .001$

Test-retest correlations are presented in
 parentheses

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The correlations of the three death anxiety measures with the two scales measuring different constructs can be used to demonstrate discriminant validity. Theoretically, the correlation between a death anxiety scale and a scale measuring some other construct should be zero (Campbell and Fiske, 1959). In the present study the three death anxiety scales appear to possess discriminate validity to essentially the same degree. All three scales were essentially correlated zero with self perceived religiosity. The Marlowe-Crowne scale was significantly correlated with each of the death anxiety measures but the relatively low correlations indicate the divergent validity of the death anxiety scales.

The majority of subjects were Catholics (N = 180, 56.3 percent). Ninety subjects were of the Protestant faith (28.1 percent). Forty-one students responded to the category None for religious affiliation (12.8 percent). Nine other students could not be classified into one of the above categories (Other category equal to 2.8 percent). The subjects' ratings of their self-perceived religiosity are listed as follows with the number and percentage choosing that category: Extremely Religious (9, 2.8); Very Religious (41, 12.8); Somewhat Religious (123, 38.4); Slightly Religious (86, 26.9); Not at all Religious (47, 14.7); Anti-Religious (14, 4.4).

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In the retest session, the subjects (281 of the original 320) were asked if they had thought about the questionnaire during the three weeks since the first testing session. One hundred forty-five students said they had thought about it (51.6 percent). One hundred thirty-six subjects (48.4 percent) said they had not thought about it. Only thirty-two subjects (11.4 percent) found the questionnaire upsetting in contrast to 249 subjects (88.6 percent) who did not.

In the second study, the DAS and LA measures of death anxiety were used. Scores obtained on the DAS ranged from 0 to 15, with a mean of 8.57 and a standard deviation of 3.69. The range of scores for the LA scale was 27 to 105, with a mean of 69.55 and a standard deviation of 17.02.

Presentation of the Results of the Analyses

Prior to testing the hypotheses of the first study, the results were examined for two unwanted significant effects. The first analysis examined any difference between the classes used in each study. In the first study it would be desirable to demonstrate that the six classes did not differ significantly on DAS, LA or LB scales. Therefore, three separate one-way analysis of variance (SPSS) procedures were conducted for the six classes using the DAS, LA, LB scale scores as the

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dependent variable. In the three anova procedures, no significant results were obtained (DAS Scale, $F = 1.88$, $df = 5/314$, $p = .096$; LA Scale, $F = 1.76$, $df = 5/314$, $p = .119$; LB Scale, $F = 1.98$, $df = 5/314$, $p = .081$). From these results, it can be said that no significant difference was found in scores obtained on either the DAS, LA or LB scales for the six classes.

In the second study, it would be desirable to demonstrate that the five classes did not differ significantly on the DAS or LA scales. Two separate one-way analysis of variance procedures were carried out for the five classes. The DAS and LA scale scores were used as the dependent variable in analyses. No significant results were obtained for either scale (DAS Scale, $F = 1.45$, $df = 4/116$, $p = .223$; LA Scale, $F = 0.29$, $df = 4/115$, $p = .882$). These results suggest that there is no significant difference in scores obtained on either of the two scales for the five classes of the second study.

The second analysis examined differences in the effect of test sequence. In the first study, each of the three scales was used as a dependent variable and was subjected to two one-way anova procedures. The first three one-way anovas consisted of all the six possible test sequences for each scale and was analyzed separately for each scale. The

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three positional possibilities are the DAS or LA or LB scale administered first, second, or third. The three positional possibilities occur twice for each scale within the six testing sequences. Simply stated, this means there are two testing sequences where the DAS is administered first, two sequences where the DAS is administered second, two sequences where the DAS is administered third, two testing sequences where the LA scale is administered first and so on through the LB scale's possibilities.

The first three F tests examined each scale in the six testing sequences. For the DAS, a significant F ratio was obtained ($F = 2.54$, $df = 5/314$, $p = .028$). Non-significant F ratios were obtained for the LA and LB scales (LA Scale, $F = 1.87$, $df = 5/314$, $p = .098$; LB Scale, $F = 2.11$, $df = 5/314$, $p = .064$).

The relationship between the three scales and test sequence could also be examined by the test sequences into the three possible positional orders for each scale. Table 6 presents these results for the DAS, LA and LB scales respectively.

From the results presented on Table 6, it is apparent that the order in which the DAS was presented in this study clearly had an effect on DAS scores. The order of presentation did not show any significant effect on either the LA or LB scales in the present study.

Table 6

The Number, Mean, Standard Deviation
and Analysis of Variance for the Three Scales
in the Three Positional Possibilities of the First Study

Test Sequence	Count	Mean	Standard Deviation
DAS First	110	6.83	3.11
DAS Second	106	6.24	3.36
DAS Third	104	7.52	3.26

Source	df	F	P
Between Test Sequence	2	4.11	.017
Within Test Sequence	317		

Test Sequence	Count	Mean	Standard Deviation
LA First	103	61.05	11.62
LA Second	108	60.29	15.15
LA Third	109	58.39	13.16

Source	df	F	P
Between Test Sequence	2	1.12	.329
Within Test Sequence	317		

Test Sequence	Count	Mean	Standard Deviation
LB First	107	60.22	12.83
LB Second	106	50.04	10.54
LB Third	107	56.79	14.93

Source	df	F	P
Between Test Sequence	2	1.97	.139
Within Test Sequence	317		

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This unexpected result suggests the superiority of the LA and LB scales with reference to order effect. It should be pointed out that this possibility was controlled by using all possible test sequences. The magnitude of the F probability for the LA scale suggests that this scale may be least susceptible to possible order effects.

These results were not replicated in the second study. In the second study, there were two positional orders using the DAS and LA scales. Non-significant F-ratios were obtained for the DAS and LA scales (DAS Scale, $F = 1.43$, $df = 1/119$, $p = .232$; LA Scale, $F = 0.11$, $df = 1/119$, $p = .733$). From these results, it can be stated that there was no order effect for either scale in the second study.

Hypothesis 1

There is no significant difference among the DAS, LA, LB scales of death anxiety for internal consistency estimates of reliability and test-retest reliability.

To assess the internal consistency of the scales, Cronbach's coefficient alpha was computed (Cronbach, 1951). The coefficient alpha estimates the reliability of the total test, considering each item as a test in the computation of the estimate. It has been called the best available estimate of internal consistency (Cronbach, 1951; Nunnally, 1967; Crano and Brewer, 1971).

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The formula is:

$$\text{Cronbach Alpha} = \frac{n}{n-1} \left(1 - \frac{\text{sum item variances}}{\text{total score variances}} \right)$$

n = number of items in the scale

An internal consistency coefficient of .76 was obtained for the DAS in the present study. This is the same coefficient that Templer (1970) reported. Internal consistency coefficients of .84 were obtained for both the LA and LB scales. Fisher's Z transformation was used to test whether the DAS and LA or LB estimates of internal consistency differed significantly. A Z of 3.046 was obtained, suggesting a significant difference at the .003 level. Thus, the internal consistency estimate of .84 (LA and LB scale) represents a significant improvement over the DAS internal consistency estimate of .76.

The internal consistency coefficient was computed for the DAS and LA scales used in the second study. An internal consistency coefficient of .81 was obtained for the DAS scale and .91 for the LA scale. Fisher's Z transformation indicated that the LA scale's internal consistency coefficient was significantly higher than the DAS scale's internal consistency coefficient ($Z = 3.085$, $p = .003$).

From these results, the first section of Hypothesis 1 was rejected and the previously stated expectations confirmed in the present project. Both the LA and LB scales significantly improve upon the internal consistency of the

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DAS. No difference between the LA and LB scales was found.

The second section of the first hypothesis deals with test-retest reliability. Test-retest reliabilities were computed by using the Pearson correlation coefficient (SPSS). The test-retest correlations are presented in Table 5. A test-retest coefficient of .84 for the DAS scale was consistent with Templer's (1970) findings. Test-retest correlations of .85 and .87 were obtained on the LA and LB scales, respectively. The results of three separate t tests for correlated data (Downie and Heath, 1970) suggested that there were no significant differences between the three test-retest coefficients. Considering these results, the second section of the first hypothesis cannot be rejected in the present study. No significant differences were found in the test-retest reliabilities of the three scales.

Hypothesis 2

There is no significant difference among the DAS, LA, LB scales of death anxiety and their correlations with the Marlowe-Crowne Scale.

Correlations between the Marlowe-Crowne Scale and the three measures of death anxiety were computed using the SPSS Pearson correlation program. In contrast to Templer's (1970) findings, the Marlowe-Crowne Scale was found to be significantly correlated with death anxiety (Table 5). In the present project, significant negative correlations

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($p < .001$) were obtained between the Marlowe-Crowne Scale and the three measures of death anxiety (MC-DAS - .21, MC-LA - .24, and MC-LB - .23). There were no significant differences between the three correlations found in the present project. These results suggest that the second hypothesis cannot be rejected for the present study.

Hypothesis 3

There is no significant difference among the DAS, LA, LB scales of death anxiety in their factor loadings on the primary factor of death anxiety, and the number of items from each scale loading on the primary factor of death anxiety.

Five separate principal axes factor analyses programs (with iterations) were carried out using the SPSS Factor program. In the first factor analysis procedure, the scores of the seven scales used in the study were entered. The seven scales are the DAS, LA and LB scales in the initial and retest condition and the Marlowe-Crowne Scale. The next three principal axes factor analyses used the items from each scale. The first analysis used the DAS items, the second the LA items and the third the LB items. The fifth principal axes factor analysis included the items from all three scales in the same analysis.

In the first analysis, using the scores from the seven

Table 7
Factor Matrix of the Seven
Scales Used in the First Study

	Factor 1	Communality
DAS Scale	.88	.78
DAS Retest	.89	.80
LA Scale	.93	.86
LA Retest	.93	.87
LB Scale	.89	.79
LB Retest	.92	.84
Marlowe-Crowne	.23	-.01
Percentage of Common Variance 73.8		

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scales, the principal axes factor analysis yielded one significant factor with an eigenvalue above 1.0, which accounted for 73.8 percent of the common variance. This factor may be considered a death anxiety factor. All three scales in the initial and retest condition loaded substantially on this factor (Table 7). The highest loadings were obtained for the LA scales in the initial and retest condition.

The communalities obtained for the death anxiety scales indicate that a considerable proportion of the reliable measurement of each scale is accounted for by the common factor variance of each scale. These high communalities suggest that the scales are valid measures of the death anxiety factor. The LA initial and retest scales obtained the highest communalities.

The factor loadings and communalities of the death anxiety scales are too similar to demonstrate a clear advantage of one scale over another.

In the factor analysis of the scales used in the study, the Marlowe-Crowne Scale loaded $-.23$ on the death anxiety factor (Table 7). In the present study, a significant negative correlation between the Marlowe-Crowne Scale and death anxiety was found in the three scales. This previously unreported finding would suggest that there is a slight tendency for individuals responding in a more socially

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desirable direction to obtain lower death anxiety scores and for individuals responding in a less socially desirable direction to obtain higher death anxiety scores.

In the next step of the analysis of the third hypothesis, each scale was taken separately and a principal axes factor analysis for the scores of the items was computed. This procedure was not designed to test a hypothesis, but can best be conceived as a "construct seeking" task whose purpose is to determine the minimum number of constructs that can account for most of the variance in the items (Cooley and Lohnes, 1971). The principal axes factor program of the items is also undertaken in the present study to identify the fundamental properties underlying the scales which increase the understanding of these scales. The three separate analyses will be presented, followed by a discussion of the factor programs. An effort to validate the results in the second study follows.

The unrotated factor matrices of the items of the three scales are presented in Appendix B. To enhance the interpretability of the matrices, each factor matrix was obliquely rotated with the Kaiser Normalization Method (Table 8 - DAS items, Table 9 - LA items and Table 10 - LB items).

Following the suggestion of Nunnally (1967), the criterion for statistical significance of the loadings was set at ± 0.30 . The results of the rotated matrices are

Table 8
Oblique Factor Matrix for the DAS Items

Item	Pattern Matrix					Structure Matrix					h ²
	1	2	3	4	5	1	2	3	4	5	
1	.20	.10	.33	.02	.07	.39	.24	.44	.05	.23	.27
2	-.08	.22	.38	-.17	.01	.12	.28	.39	-.17	.09	.23
3	.23	-.01	.31	.25	.11	.41	.13	.43	.29	.27	.33
4	.62	.07	-.02	.07	.01	.65	.23	.25	.13	.27	.43
5	.07	-.13	.65	.10	-.02	.29	.01	.65	.12	.09	.45
6	.47	-.02	.20	-.34	.15	.57	.18	.40	-.27	.33	.48
7	-.05	-.03	.64	.13	.00	.21	.08	.62	.14	.09	.40
8	.03	.66	.00	.18	.11	.26	.69	.17	.18	.29	.52
9	.44	.05	.08	-.01	-.11	.45	.15	.24	.03	.08	.22
10	.10	.07	.01	.03	.60	.15	.19	.08	.07	.58	.35
11	.40	-.09	-.06	-.09	.37	.49	.09	.14	-.02	.48	.36
12	.11	.70	-.08	-.10	-.01	.25	.72	.10	-.09	.17	.53
13	.36	.11	-.01	.11	.06	.43	.22	.17	.15	.23	.21
14	.18	.09	.18	.31	.12	.35	.20	.30	.35	.27	.28
15	.05	.00	.42	-.13	.00	.20	.10	.44	-.11	.07	.21
Percentage of Common Variance						Factor Correlations					
54.6						1					
19.1						2	.26				
12.1						3	.40	.20			
7.8						4	.10	-.01	.26		
6.4						5	.37	.24	.17	.09	
Cumulative %											
54.6											
73.7											
85.9											
93.6											
100%											

Table 9
Oblique Factor Matrix for the LA Items

Item	Pattern Matrix				Structure Matrix				h ²
	1	2	3	4	1	2	3	4	
1	.67	.03	.14	.01	.77	.32	.56	.25	.61
2	.01	.05	.02	.64	.23	.13	.20	.66	.43
3	.51	.01	.14	.00	.60	.24	.46	.19	.38
4	.16	.10	.52	-.03	.49	.35	.65	.16	.44
5	.90	-.01	-.08	-.08	.82	.24	.43	.17	.68
6	.13	-.10	.52	.12	.45	.16	.59	.28	.39
7	.71	.00	-.08	.26	.74	.24	.41	.45	.60
8	.13	.89	-.07	-.08	.36	.90	.33	.05	.82
9	.07	.00	.61	.04	.31	.22	.58	.17	.34
10	.28	.17	.12	-.01	.41	.31	.35	.13	.21
11	-.01	.01	.69	-.06	.40	.27	.67	.12	.46
12	-.09	.68	.06	.11	.20	.68	.29	.17	.48
13	.05	.06	.49	-.01	.36	.26	.54	.13	.30
14	.37	.04	.11	-.05	.43	.20	.34	.09	.20
15	.29	.00	.08	.21	.40	.16	.31	.32	.21
Percentage of Common Variance					Factor Correlations				
66.9					1				
15.3					2	.34			
10.5					3	.60	.39		
7.2					4	.30	.11	.25	
Cumulative %									
66.9									
82.3									
92.8									
100%									

Table 10
Oblique Factor Matrix for the LB Items

Item	Pattern Matrix				Structure Matrix				h ²
	1	2	3	4	1	2	3	4	
1	.47	-.26	-.05	.26	.63	-.55	-.09	.41	.55
2	.01	-.04	.09	.44	.09	-.16	.06	.45	.21
3	.66	.06	-.16	.18	.67	-.31	-.20	.28	.50
4	.23	-.46	-.05	.14	.48	-.61	-.09	.30	.44
5	.25	.04	-.51	-.06	.24	-.09	-.51	-.01	.32
6	-.09	-.66	-.13	.16	.27	-.67	-.16	.32	.49
7	.60	-.12	-.24	.44	.74	-.54	-.29	.58	.84
8	.42	-.25	.11	-.10	.53	-.43	.08	.03	.34
9	-.09	-.70	.07	.08	.26	-.68	.04	.25	.48
10	.69	-.13	.28	-.06	.73	-.44	.24	.08	.62
11	.07	-.66	.06	-.05	.38	-.68	.03	.14	.47
12	.29	-.20	-.12	-.03	.39	-.34	-.14	.08	.19
13	.17	-.61	-.04	-.14	.44	-.66	-.07	.05	.47
14	.47	-.05	.02	-.03	.49	-.27	.00	.06	.24
15	.16	.04	.32	.02	.13	-.03	.32	.03	.12
Percentage of Common Variance					Factor Correlations				
70.6					1				
13.4					2	-.49			
9.6					3	-.04	.04		
6.4					4	.16	-.26	-.04	
Cumulative %									
70.6									
84.0									
93.6									
100%									

Table 11

Factor Interpretation of the DAS
Items Loading Above Criterion

Factor 1 - Physical Death Fear	
Item	
*4	I dread to think about having to have an operation.
6	I am not particularly afraid of getting cancer.
9	I fear dying a painful death.
11	I am really scared of having a heart attack.
13	I shudder when I hear people talking about World War III.
Factor 2 - Time Fear	
Item	
*12	I often think about how short life really is.
* 8	I am often distressed by the way time flies so rapidly.
Factor 3 - High Death Fear	
Item	
*5	I am not at all afraid to die.
*7	The thought of death never bothers me.
15	I feel that the future holds nothing for me to fear.
2	The thought of death seldom enters my mind.
1	I am very much afraid to die.
3	It doesn't make me nervous when people talk about death.
Factor 4 - Ugliness of Death	
Item	
6	I am not particularly afraid of getting cancer.
14	The sight of a dead body is horrifying to me.
Factor 5 - Fear of Afterlife	
Item	
*10	The subject of life after death troubles me greatly.
11	I am really scared of having a heart attack.

* high loadings (between .50 and .70)
 ** very high loadings (above .70)

Table 12

Factor Interpretation of the LA
Items Loading Above Criterion

Factor 1 - High Death Fear

Item	
**5	I am not at all afraid to die.
**7	The thought of death never bothers me.
*1	I am very much afraid to die.
*3	It doesn't make me nervous when people talk about death.
14	The sight of a dead body is horrifying to me.

Factor 2 - Time Fear

Item	
**8	I am often distressed by the way time flies so rapidly.
*12	I often think about how short life really is.

Factor 3 - Physical Death Fear

Item	
*11	I am really scared of having a heart attack.
*9	I fear dying a painful death.
*4	I dread to think about having to have an operation.
*6	I am not particularly afraid of getting cancer.
13	I shudder when I hear people talking about World War III.

Factor 4 - Death Avoidance

Item	
*2	The thought of death seldom enters my mind.

- * high loadings (between .50 and .70)
 ** very high loadings (above .70)

Table 13

Factor Interpretation of the LB
Items Loading Above Criterion

Factor 1 - High Death Fear	
Item	
*10	The subject of life after death scares me greatly.
*3	To talk of my death does not bother me.
*7	The thought of my death does not bother me.
1	I am extremely afraid to die.
14	I could not touch a dead body.
8	I am frightened by the way life races by.
Factor 2 - Physical Death Fear	
Item	
*9	I am greatly afraid of dying a painful death.
*6	I am not terrified of getting cancer.
*11	I am terrified of having a heart attack.
*13	I am terrified of being involved in World War III.
4	I would be extremely fearful to have a serious operation.
Factor 3 - Acceptance of Death	
Item	
*5	I am looking forward to death.
15	There is nothing in the future for me.
Factor 4 - Death Avoidance	
Item	
2	The thought of my own death never enters my mind.
7	The thought of my death does not bother me.

* high loadings (between .50 and .70)
 ** very high loadings (above .70)

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summarized for the items of each scale in Table 11 (DAS items), 12 (LA items), and 13 (LB items). In these tables, the factors are named and the items that constitute that factor are presented.

The principal axes analysis of the DAS items yielded five factors with eigenvalues above 1.0. Four factors with significant eigenvalues were obtained in the principal axes analyses of the LA and LB scales. Using the ± 0.30 criterion, it was found that two factors of each scale contained at least three items above this value (Tables 8, 9, 10). This suggests that these two factors in each scale are stable and replicable (Fruchter, 1954). The two stable factors found in one analysis appear to be the same two stable factors found in the other analyses. Thus far, it can be said that the scales are not factorially "pure". The scales are factorially complex, containing at least two stable and reproducible factors and it appears that the scales measure the same stable factors.

The most prominent stable factor can be defined as a "High Death Fear" factor. This factor is found in factor 3 (12.1% of the common variance) of the DAS analysis. Six of the DAS items loaded above criterion, two with high loadings (Table 8). The "High Death Fear" factor of the LA analysis was factor 1 (66.9% of the common variance). Five items loaded above criterion of which two were high and two were

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very high (Table 9). Factor 1 (70.6% of the common variance) of the LB analysis is the "High Death Fear" factor. Six items loaded above criterion. Three of the six loadings were high (Table 10).

An examination of Tables 11 (factor 3), 12 (factor 1), and 13 (factor 1) will reveal why the factor in each of the tables is named the same. Items 1, 3, and 7 are found in all three factors. It is true that the LB items are not worded the same as the DAS and LA items, but they convey essentially the same meaning. The items involve fear of death, thinking about death and talking about death. Item 5 was common to the DAS and LA factors and received the highest loading, but did not load on the LB factor. The reason that this item did not load on the LB factor was that the meaning of the item was probably significantly altered when reworded. The items of the three factors suggest that each factor is a "High Death Fear" factor.

The second stable factor is defined as a "Physical Death Fear" factor. This factor is found in factor 1 (54.6% of the common variance) of the DAS analysis, factor 3 (10.5% of the common variance) of the LA analysis and factor 2 (13.4% of the common variance) of the LB analysis. It is readily apparent why the factor is named the same in each analysis. The same five items (LB items figuratively

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the same), 4, 6, 9, 11, and 13, load above criterion on each of the factors. The items deal with an operation, illness, painful death and war.

The remaining factors found in each of the analyses are of questionable stability. Three such factors were found in the DAS analysis. Factor 2 can be defined as a "Time Fear" factor from the similarity of the two items loading highly on it. The remaining two factors are rather weakly defined. Factor 4 appears to be an "Ugliness of Death" factor with two items relating to cancer and the sight of a dead body. Factor 5 of the DAS analysis appears to be a "Fear of Afterlife" factor. The two items loading on this factor relate to sudden demise and fear of afterlife.

The LA and LB analyses each yielded two factors of questionable stability. A "Death Avoidance" factor is found in both scales (LA factor 3 and LB factor 4). One item in the LA analysis and two items in the LB analysis loaded on this factor. Factor 2 of the LA analysis is defined as a "Time Fear" factor. Of the factors considered questionable this seems to be the most promising because of the magnitude of the factor loadings. The two items that constitute this factor are the same items that make up the "Time Fear" factor in the DAS analysis. Factor 3 of the LB analysis is weakly defined as an "Acceptance of Death" factor.

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The design of this project, consisting of two separate studies with large samples, affords the opportunity to replicate the principal axes factor analyses with the data from the second study for two of the three scales. The LB scale was not included in the second study as it did not prove to be better than the LA scale in the first study. These results will be briefly discussed.

The results of the principal axes factor analyses for the second study are presented in Appendix C. In the DAS analysis five factors are again found. The two stable factors, i.e., "High Death Fear" and "Physical Death Fear" found in the first study are present in the second analysis. The "High Death Fear" factor in the second study is the first factor accounting for 56.0 per cent of the common variance. The "Physical Death Fear" factor is factor 2 (16.8% of the common variance). Of the three remaining factors, only factor 4 ("Time Factor") was present in the first study. Only two factors are found in the LA analysis. The first factor (87.9% of the common variance), with many substantial loadings, suggests in this analysis that the LA scale is saturated with this factor. This factor appears to be the "High Death Fear" factor found in the first study. The second factor (12.1% of the common variance) obtained is the "Physical Death Fear" factor found in the first study.

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These results suggest that the "High Death Fear" and "Physical Death Fear" are stable and replicable factors.

The final procedure in the examination of the third hypothesis consisted of using the items of three scales together in a principal axes factor analysis. Combining the items from the three scales in the same analysis afforded the opportunity to compare the number of items from each scale in their contribution to defining the factors. The main concern in this analysis is the number of items contributing to a primary death anxiety factor would be obtained in the principal axes factor analysis of the items of the three scales together in the same analysis. Because of the obvious bias on the writer's behalf, the factors were named via the Delphi method.

Twelve factors were found of which most seemed to correspond to a particular common item in the three scales. The first five factors which accounted for 74.5 per cent of the common variance in the oblique rotation are presented in Table 14. Only those items that loaded above criterion on the five factors are reproduced in the table. Appendix D presents the orthogonal rotation in a similar manner.

The factors were named in a different manner than in the previous analyses. In the previous principal axes factor analyses, the factors were named by this writer.

Table 14

Oblique Factor Matrix for the DAS, LA and LB Items
Loading Above Criterion on the First Five Factors

Item		Pattern Matrix					Structure Matrix				
		1	2	3	4	5	1	2	3	4	5
DAS	1	.81					.79				
	2					.62					.67
	3				-.30					-.47	
	8			.70					.73		
	11		.69					.72			
DAS LA	12			.72					.71		
	14				-.76					-.76	
	1	.64					.81				
	2					.83					.83
	3	.32			-.31		.54			-.52	
LA LB	5	.33					.65				
	7					.32					.36
	8			.81					.83		
	11		.86					.90			
	12			.79					.77		
LB	14				-.95					-.93	
	1	.66					.81				
	2					.56					.57
	7	.30					.65				
	8			.67					.76		
LB	11		.86					.91			
	12			.30					.36		
	14				-.74					-.76	
Percentage of Common Variance		42.8	10.0	9.1	7.0	5.4	Factor Correlations				
Cumulative %		42.8	52.9	62.0	69.0	74.5	1	2	3	4	5
								.22	.25	.22	
								-.31	-.17	-.18	
								.06	.07	.11	-.0

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In the present analysis, the factors were named using a modified version of the Delphi method. The Delphi method is basically an iterative process where a group of individuals react to a situation, are given feedback on their reactions, and then asked to react to the situation again based on the group's response (Linstone and Turoff, 1975).

In using the Delphi method to name the factors, nine graduate students and wives of graduate students were given a list of the items that defined the first five factors. If the same item from the DAS and LA scale loaded significantly on a factor, the item was only listed once, as the wording is exactly the same. Similar LB items, however, were listed. The items were listed in order of their contribution to the factor. The listing of the items presented to the graduate students is reproduced in Table 15.

The subjects were told that the items were grouped together because they had something in common yet different from the other items that were in different groups. In other words, all of the items dealt with death anxiety but they were grouped together because they represented different aspects of death anxiety. These groups of items could be called different factors of death anxiety. They were told it would be their task to define these different factors.

Table 15

Items Used in the Delphi Technique to Name the Factors

Factor-

I am very much afraid to die.
I am extremely afraid to die.
It doesn't make me nervous when people talk about death
I am not at all afraid to die.
The thought of my death does not bother me.

Factor-

I am really scared of having a heart attack.
I am terrified of having a heart attack.

Factor-

I am often distressed by the way time flies so rapidly.
I am frightened by the way life races by.
I often think about how short life really is.
Death will come too soon for me.

Factor-

It doesn't make me nervous when people talk about death.
The sight of a dead body is horrifying to me.
I could not touch a dead body.

Factor-

The thought of death seldom enters my mind.
The thought of my own death never enters my mind.
The thought of my death does not bother me.

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The names the subjects had selected for the factors were collated for each factor. A panel of three subjects were given feedback listing the names the subjects had selected for the factors. They were instructed to come to an agreement and choose which names best define the factors. Ideally, all nine subjects should be given feedback and participate in the group defining the factor.


Factor 1, which accounted for 42.8 per cent of the common variance, was defined by the panel as a "General Death Anxiety" factor. Factor 2 (10.0% of the common variance) was defined as a "Fear of Heart Attack" factor. The third factor (9.1% of the common variance) was defined as a "Time" factor. The panel labeled factor 4 (7.0% of the common variance) a "Death Avoidance" factor. The fifth factor (5.4% of the common variance) was defined as a "Death Thoughts" factor.

In contrasting the factors named via the Delphi method, using the items from the three scales and the factors named by this writer in the three separate analyses, there is much similarity. The factor defined as a "General Death Anxiety" by the panel of subjects is similar in content to the "High Death Fear" factor defined by this writer. The "Time" factor was defined in the same manner by the writer and using all items with the Delphi method. The Delphi "Denial-Avoidance"

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factor is similar to the "Death Avoidance" factor named by the writer in the analyses of the LA and LB items. It is interesting to note that stable factor "Physical Death Fear" found in the analyses of the items of each scale was not found when the items of the three scales were combined in the same analysis.

Unfortunately, little work has been done using factor analysis with death anxiety measures. Those few that have been done report similar factors to those found in the present study. A factor analysis of a scale developed by Nelson and Nelson yielded four factors: (1) death avoidance, (2) death fear, (3) death denial and (4) reluctance to interact with the dying (Nelson and Nelson, 1975). The Dickstein scale was found to consist of two factors which were named: (1) a negative evaluation and (2) a conscious contemplation of death (Klug and Boss, 1976; 1977). Thorson (1977) conducted a factor analysis of a scale developed by Nehrke and reported four distinct factors: (1) fear of isolation and immobility, (2) fear of pain, (3) fear of the future and (4) fear of physical decomposition. There are obvious similarities between the factors found in these three different scales with different items and the factors found in the present study. These studies, along with the present study provides some consensual validation that



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questions typically chosen to measure death anxiety are likely to tap these kinds of dimensions.

The major factors found in the present study were High Death Fear-General Death Anxiety, and Physical Death Fear. As previously reported, similar factors were found in the factor analysis of other death anxiety scales.

The factor defined as High Death Fear or General Death Anxiety is widely recognized. Feifel and Branscomb (1973) stated, "Although differences exist in its intensity and manifestation, the universality of concern about death is widely recognized" (p.282). Stolorow (1973) from a review of psychoanalytic and existential literature on death concluded that all human beings fear death and that it could be a particular form of anxiety or the underlying dynamic of all anxiety. It has been assumed by most, if not all, researchers in the field that death universally elicits anxiety (Feifel and Branscomb, 1973; Kastenbaum and Costa, 1977).

The idea of a Physical Death Fear can be traced to the work of Freud. He claimed death anxiety resulted from a fear of castration (Freud, 1960). This theory does not appear to be widely held in the literature. Feifel and Hermann (1973) found that psychiatric patients are more fearful of death and perceive death in more physical

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and violent terms than do normals. Nogas, Schweitzer and Grumet (1974) reported a study in which college students who were high in death anxiety were more likely to offer a macabre personification of death than students who were moderate or low in death anxiety. The macabre personifications often had physical themes. The most compelling support for a Physical Death Fear factor comes from a study conducted by Dudley, Verhey, Masuda, Martin and Holmes (1969). The authors followed terminally ill patients over a four year period. It was found that the probability of dying was increased when the patients showed inordinate concern over the physical aspects of their terminal illness.

On Table 14 the factor loadings of the items that load significantly on the factors are presented. The factor loadings of similar items on a factor can be compared statistically. This is accomplished by testing the difference of factor loadings of two similar items on a factor. The factor loadings are correlations between the item and the factor; therefore, the test of significance is between two correlation coefficients for correlated data. The test of significance is:

$$t = \frac{(r_{12} - r_{13}) \sqrt{(N-3)(1+r_{23})}}{\sqrt{2(1-r_{12}^2-r_{13}^2-r_{23}^2+2r_{12}r_{13}r_{23})}}$$

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In the formula on previous page r_{12} is the correlation of an item with the factor (factor loading), r_{13} is the correlation of a similar item with the factor (factor loading) and r_{23} is the correlation between the two items. As an example, the similar item factor loadings of factor 1 will be discussed. There are six significant factor loadings on factor 1. Three of these factor loadings are similar items i.e., the first item from each scale. These factor loadings are .81 (DAS item 1), .64 (LA item 1), and .66 (LB item 1). Thus, there are three possible comparisons to determine if one factor loading is significantly higher than another i.e., DAS-LA, DAS-LB and LA-LB.

All possible comparisons were made for similar items on each of the factors. On factor one the DAS factor loading is significantly higher ($p < .001$) than the LA or LB factor loading. There was no difference between the LA or LB factor loading. On factor two the LA and LB factor loadings are both significantly higher ($p < .001$) than the DAS factor loading. There was no significant difference between the LA and LB factor loadings. On factor three two similar items from each scale load significantly on the factor. The factor loading for LA item eight is significantly higher ($p < .001$) than DAS or LB similar item factor loading on the third factor. There was no difference between the DAS and LB factor loadings

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for item eight. The factor loading for LA item eleven on the third factor is significantly higher than the DAS ($p < .01$) or LB ($p < .001$) similar item factor loading. The DAS factor loading was significantly higher ($p < .001$) than the LB factor loading for similar item number eleven on the third factor.

On the fourth factor there is one similar item that loads significantly for all three scales (number 14). Item three does load significantly for both the DAS and LA scale. There is no significant difference between the item three DAS and LA factor loadings. There is a significant difference ($p < .001$) between the LA and DAS or LB factor loading for item fourteen. The LA item has a significantly higher negative factor loading on the fourth factor. There was no significant difference between the DAS and LB factor loading. Item number two from each scale loads significantly on factor five. The LA factor loading is significantly higher ($p < .001$) than the DAS or LB factor loading. There was no significant difference between DAS and LB similar item factor loadings for the fifth factor.

Thus, in comparing the results of factor loadings obtained for similar items, the following results were found. A DAS factor loading was found to be significantly higher than one similar item LA factor loading and two similar item LB factor loadings. A LA factor loading was found to be

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significantly higher than five similar item DAS factor loadings and four similar item LB factor loadings. A LB factor loading was found to be significantly higher than one similar item DAS factor loading. No LB factor loadings were found to be significantly higher than similar item LA factor loadings. These results suggest that generally the LA items are going to load significantly higher than similar items from the other scales.

The loadings of the three scales on the five factors are similar. That is, the same items from each scale load on the same factor. The LA scale does a better job at defining two of the factors by having more items load on that factor than the other scales. On the "General Death Anxiety" factor, three LA items load above criterion compared to one DAS and two LB items. Two LA items load above criterion on the "Death Thoughts" factor in contrast to one DAS and LB item.

In using the items from all three scales in the same analysis, the communalities across similar items can be compared. Table 16 presents the communalities obtained for the items of the three scales. The common factor variance (communality) is a validity component of the item. The communalities can be compared by treating each communality as a multiple correlation coefficient and

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seeing if a significant effect is obtained by adding another variable i.e., another communality (Ward, 1977).

The test of significance is:

$$F = \frac{(R^2_{y.12} - R^2_{y.1})/M}{(1-R^2_{.12}) (N-K-1)}$$

In the formula the hypothesis is tested that variable 2 does not add significantly to the variation in y already explained by variable 1. M in the formula, as it is presently applied, will be equal to one i.e., the number of independent variables in the subset for which the significance test is being made. The total number of independent variables (K) will be equal to two. Degrees of freedom for the F ratio will be 1(M) and 317 (N-K-1).

As an example, the communalities obtained for item one will be discussed. The communalities obtained for item one were .66 (DAS), .76 (LA) and .75 (LB). There is virtually no difference between the communalities for item one on the Likert scales, but there is a difference of .09 or .10 between the DAS item one communality and the Likert communalities. The test of significance is applied to see if the Likert communality (either LA or LB) would add significantly to the explained variation. The DAS and LA comparisons would be made in the following manner. The DAS item one communality of .66 is considered a multiple R

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when squared its value is .44 (R^2) similarly the LA item one R^2 value is .58. When applied in the formula, a non-significant F value is obtained. Therefore, the LA item one communality is not significantly higher than the DAS item one communality. The LB item one communality was also found to be not significantly higher than DAS item one.

All possible comparisons were made for the communalities of each item. Only one DAS communality was found to be significantly higher ($p < .05$) than an LA or LB item. The communality of DAS item 15 was significantly higher than the LA or LB communality. Seven communalities of the LA items were found to be significantly higher ($p < .05$) than DAS item communalities (items 5,7,9,10,11,13 and 14). Five LA item communalities were found to be significantly higher ($p < .05$) than LB item communalities (items 2,5,12,13 and 14). Two LB item communalities were found to be significantly higher ($p < .05$) than DAS item communalities (items 10 and 11). No LB item communalities were found to be significantly higher than LA item communalities. These results suggest that LA item communalities will generally be significantly higher than DAS or LB item communalities. Thus, the items of the LA scale appear to have higher construct validity than the items of the DAS or LB items.

Table 16

The Communalities Obtained in the Principal Axes
Factor Analysis of the DAS, LA and LB Items

Item	DAS Scale	LA Scale	LB Scale
1	.66	.76	.75
2	.49	.70	.38
3	.39	.53	.52
4	.65	.72	.76
5	.47	.71	.17
6	.64	.71	.58
7	.46	.77	.70
8	.57	.73	.65
9	.59	.81	.77
10	.34	.71	.73
11	.54	.82	.84
12	.56	.63	.24
13	.68	.86	.60
14	.59	.88	.59
15	.81	.41	.07

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The principal axes factor analysis of the items for two of the three scales was replicated with the data from the second study. These results are presented in Appendix E and will be briefly discussed.

Nine factors were found, the first four of which accounted for 78.2 per cent of the common variance. The first factor could be defined as the "General Death Anxiety" factor found in the first study. Four DAS items and six LA items load above criterion. It can be said the LA items define the factor better than the DAS items. Three of the LA similar item factor loadings are significantly higher ($p < .001$) than DAS item factor loadings (the exception is item 2). The remaining factors were not found in the first study, although factor 2 is similar. Factor 2 in the present analysis cannot be defined as a "Fear of Heart Attack" factor. It appears to be similar to the "Physical Death Fear" factor found in the analyses of the items within the scales. Eleven LA items had higher communalities than DAS items.

The first section of the third hypothesis was unable to be rejected in the present study. The LA initial and retest scales do load higher on the primary factor of death anxiety than the DAS scales, but not to any great extent. The DAS, LA, and LB scales load substantially on the death anxiety factor

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and are equally valid measures of that factor.

The results of the principal axes factor analysis of the items of each scale suggested that the three scales contain two stable and replicable similar factors. The first factor was defined by the writer as "High Death Fear" and the second as "Physical Death Fear". The stable and replicable nature of these two factors was demonstrated using the data from the second study.

The second section of the third hypothesis is rejected in the present project. In the results from both studies, the LA items load more items on the "General Death Anxiety" factor than the DAS items. It can be said that the LA items do a better job defining the "General Death Anxiety" factor than the DAS items. The expected results of LB items loading the most items on the factor was not found. The LA items do a better job defining the "General Death Anxiety" factor than the LB items.

Hypothesis 4

There is no significant difference among the DAS, LA, LB scales of death anxiety for males and females.

Five separate discriminant analysis programs were carried out using the SPSS Discriminant Analysis program.

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In the first discriminant analysis, the scores from the DAS, LA, and LB scales were used. The next three discriminant analyses used the scores from the items of each scale. The DAS items were used in the first analysis, LA items in the second analysis, and LB items in the third analysis. The fifth discriminant analysis included the items from all three scales in the same analysis. The results of the five discriminant analyses are presented in Tables 17 through 20.

From the results shown on Table 17, it is apparent that females, as a group, score higher than males on all three scales of death anxiety. This difference is statistically significant for all of the three scales (Table 18). Females scoring significantly higher than males on the three scales was expected.

The discriminant analyses were performed in a stepwise procedure. The first variable selected in the procedure is the single best discriminating variable between the groups in the analysis. The next variable selected is the variable that improves most upon the discrimination in combination with the first variable. The process continues until the remaining variables can no longer contribute to the discrimination. The stepwise method used was Wilks' determinant ratio test statistic (Λ). It is a test of

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the discriminating power of a test battery. The criterion of Wilks' Lambda "is the overall multivariate F ratio for the test of differences among group centroids" (Nie, et. al., 1975).

The results from Table 19 indicated that in the five discriminant analyses for sex, the discrimination was statistically significant. This means that in each analysis, the variables included in that analysis were able to discriminate between the group centroids for males and females.

In the first analysis there was only one stepdown procedure. The LA scale was selected as the best discriminating scale. The advantage it offers over the DAS or LB scales, however, appears negligible. There was no significant difference in Fr values (r associated with F test). The formula is presented in the discussion of hypothesis 6. Thus, there is no difference between the discrimination ability of the three scales for sex.

The items of the three scales are equally adequate in discriminating between the two groups. The canonical correlations for the items of the scales are very similar. The only difference appears to be that in the LA scale, more items are contributing to the discrimination. Seven items contribute to the discrimination in the DAS and LB

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scales and nine in the LA scale. The results of the discriminant analyses were used to predict group membership. The DAS items correctly classified 61 males (50.8%) and 158 females (79.0%) for a total of 68.4% of cases correctly classified. The LA items correctly classified 50 males (41.7%) and 172 females (86.0%) for a total of 69.4% of cases correctly classified. The LB items correctly classified 48 males (40.0%) and 168 females (84.0%) for a total of 67.5% of cases correctly classified. These results suggest that although discrimination is statistically significant, there is considerable overlap between males and females on each of the three scales.

The items of all the scales were included in the final analysis for males and females. The items contributing significantly to the discrimination are listed in Table 20. The most discriminating variable is item 13 from the LA scale. Four DAS items, one LA item and three LB items contribute significantly to the discrimination of item LA 13. The items that contribute most to the discriminant function are LA 13, LB 7 and DAS 3. Clearly, the items of a particular scale have not been demonstrated to be better than the items of another scale in discriminating between males and females.

From the results of this study, hypothesis 4 was unable to be rejected. A Likert scale (LA) was selected as the best discriminating scale, but this

Table 17

Number, Group Means and Standard Deviations for Sex and Religious Self-Perception on the Three Death Anxiety Scales

	DAS Scale	LA Scale	LB Scale
<hr/>			
	Group Means		
<hr/>			
SEX			
Males (120)	5.983	56.033	55.033
Females (200)	7.380	62.195	60.895
<hr/>			
SELF-PERCEPTIONS			
ALL CATEGORIES			
Extremely Rel. (9)	4.778	49.778	49.333
Very Rel. (41)	6.878	58.829	56.829
Somewhat Rel. (123)	7.480	62.244	60.228
Slightly Rel. (86)	6.779	60.361	59.640
Not at all Rel. (47)	6.021	57.532	57.319
Anti Rel. (14)	5.929	53.714	55.571
<hr/>			
SELF-PERCEPTIONS			
High Self Per. (50)	6.500	57.200	55.480
Medium Self Per. (209)	7.191	61.269	59.986
Low Self Per. (61)	6.000	56.656	56.918
<hr/>			
	Standard Deviations		
<hr/>			
SEX			
Males	3.024	13.575	13.305
Females	3.318	12.813	12.230
<hr/>			
SELF-PERCEPTIONS			
ALL CATEGORIES			
Extremely Rel.	2.863	16.092	16.830
Very Rel.	3.116	12.306	11.921
Somewhat Rel.	3.528	14.225	13.497
Slightly Rel.	3.054	12.027	12.052
Not at all Rel.	2.855	11.753	11.442
Anti Rel.	3.339	16.457	16.037
<hr/>			
SELF-PERCEPTIONS			
High Self Per.	3.151	13.501	13.065
Medium Self Per.	3.357	13.366	12.895
Low Self Per.	2.944	12.931	12.516

Table 18

Univariate F-Tests for Sex and Religious
Self-Perception on the Three Death Anxiety Scales

For Sex			
	Wilks' Lambda	F	P
DAS Scale	.957	14.188	.001
LA Scale	.950	16.581	.001
LB Scale	.952	16.122	.001

df = 1/318

For Self-Perceived Religiosity (for six initial groups)			
	Wilks' Lambda	F	P
DAS Scale	.962	2.518	.030
LA Scale	.957	2.811	.017
LB Scale	.975	1.841	.104

df = 5/314

For Self-Perceived Religiosity (groups combined into high, medium, low)			
	Wilks' Lambda	F	P
DAS Scale	.978	3.526	.030
LA Scale	.973	4.308	.014
LB Scale	.980	3.200	.041

df = 2/317

Table 19

Summary of the Discriminant Function Analyses
for Sex and Religious Self-Perception

For Sex							
Analysis	Function	Relative Percentage	Canonical Correlation	Wilks' Lambda	Chi Square	df	P
DAS, LA, LB Items	1	100	.682	.535	196.47	1	.001
DAS Items	1	100	.383	.854	49.79	7	.001
LA Items	1	100	.378	.858	48.20	9	.001
LB Items	1	100	.357	.872	42.95	7	.001
DAS, LA, LB Items	1	100	.505	.745	91.27	16	.001

For Self-Perceived Religiosity							
Analysis	Function	Relative Percentage	Canonical Correlation	Wilks' Lambda	Chi Square	df	P
DAS, LA, LB Scales	1	61.20	.148	.964	11.46	4	.02
	2	38.80	.118	.986	4.46	1	.04
DAS Items	1	64.55	.216	.929	23.35	8	.003
	2	35.45	.161	.974	8.33	3	.04
LA Items	1	61.49	.316	.842	54.00	18	.001
	2	38.51	.255	.935	21.05	8	.007
LB Items	1	62.78	.306	.854	49.53	14	.001
	2	37.22	.240	.942	18.66	6	.005
DAS, LA, LB Items	1	58.23	.402	.736	94.50	36	.001
	2	41.77	.349	.878	40.03	17	.001

Table 20

Standardized Discriminant Function Coefficients
for Sex and Religious Self-Perception Discriminations

		Sex	
		Function 1	
LA 13		-.72	
DAS 3		-.44	
DAS 1		.39	
LB 7		-.54	
LA 10		.26	
LB 2		-.22	
DAS 4		-.27	
DAS 11		.18	
LB 15		.17	
		Self-Perception	
		Function 1	Function 2
LA 1	-.54		.53
LB 12	-.28		-.43
LB 11	.50		.05
LB 2	.38		-.43
LA 14	.40		.10
LA 3	-.18		.45

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did not represent a significant improvement upon the DAS scale. The items of the three scales did an equally adequate job in discriminating between males and females.

Hypothesis 5

There is no significant difference among the DAS, LA, LB scales of death anxiety for self-perceived religiosity.

The fifth hypothesis was investigated in a similar manner as the fourth. Five multiple discriminant analyses were conducted. The scores from the three scales were used in the first analysis, scores from the items of each scale in the next three analyses and scores from the items of all three scales combined in the final analysis.

Table 17 presents the means and standard deviations for the six groups of self-perceived religiosity. Table 17 indicates that the lowest mean death anxiety score was obtained for the subjects that rated themselves extremely religious across all three scales. The highest mean death anxiety score was obtained across the three scales for the subjects that rated themselves somewhat religious.

The six groups combined into high, medium and low categories are also presented in Table 17. Those subjects classified as low in terms of self-perceived religiosity obtained the lowest mean death anxiety score on two of the three scales. The exception was on the LB scale

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where the high group obtained the lowest mean score. The highest mean score was obtained for the medium group for all three scales.

From the results presented in Table 18, there appears to be significant differences between the six groups for self-perceived religiosity. The F ratio is below the .05 level for two of the scales (DAS and LA) and at the .10 level for the LB scale. When the six groups are combined into high, medium and low, the F ratios for the three scales are all significant beyond the .05 level. The reported F tests should be considered with caution because of the unequal number of subjects in each group. The SPSS program does have default option which imposes orthogonality of the independent variables, which was used in the present study. Bartlett's test for homogeneity of variance was nonsignificant for all reported F tests indicating that the variance of the groups in the analysis of variance procedures was homogeneous.

The main focus of the present hypothesis is in the high, medium and low groups of self-perceived religiosity. Three post hoc one tailed T tests were conducted for each scale, comparing the three groups. The high group obtained a significantly lower mean score than the medium group on two of the three scales (LA Scale, $t = -2.03$, $df = 257$,

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$p = .02$; LB Scale, $t = -2.21$, $df = 257$, $p = .01$). The DAS scale's results approached significance ($t = -1.32$, $df = 257$, $p = .09$). There was no significant difference between the mean death anxiety scores for the high and low groups on any scale (DAS Scale, $t = 0.86$, $df = 109$, $p = .20$; LA Scale, $t = 0.22$, $df = 109$, $p = .41$; LB Scale, $t = 0.59$, $df = 109$, $p = .28$). The group classified medium in self-perceived religiosity had a significantly higher mean death anxiety score than the group classified low for all three scales (DAS Scale, $t = 2.50$, $df = 268$, $p = .007$; LA Scale, $t = 2.49$, $df = 268$, $p = .007$; LB Scale, $t = 1.65$, $df = 268$, $p = .05$).

These findings provide support for the contention that the strength of one's conviction is the important determinant in one's fear of death. As expected, the two extreme groups highs and lows had lower mean death anxiety scores than the medium group. In considering these results, it is important to note that the choice of self-perceived religiosity did not significantly correlate with the Marlowe-Crowne Scale ($r = .07$, $p = .12$).

The results from Table 19 indicate that in the five discriminant analyses for the three classifications of self-perceived religiosity, the discrimination was statistically significant. Two discriminant functions were found in each analysis and each discriminant function significantly

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discriminated between the three groups.

In the first analysis, the LA scale was selected in the first stepdown procedure, but later removed. The DAS and LB scales were retained. This suggests that the information contained in the LA scale about group differences is available in the DAS and LB scales to a greater extent. Thus, the LA scale was redundant and eliminated. From this analysis, no scale demonstrated an advantage over another to any great extent. There was no significant difference in Fr values. Thus, there is no difference between the discrimination ability of the three scales for self-perceived religiosity.

The items in each of the three scales are able to significantly discriminate between the three group centroids. More items contribute to the discrimination in the LA and LB scales than in the DAS scale. Nine LA items, seven LB items and only four DAS items contribute to the discrimination within the three scales.

Although the items of the three scales appear to be equal in the percentage of cases correctly classified, the Likert items offer a slight advantage over the DAS items. The DAS items predicted 65% of the cases correctly, the LA items 66% and the LB items 65%. The DAS items predicted 65% of the cases correctly by predicting all of the subjects in the second group. In other words, 100% of the cases were

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correctly classified in medium group and 0% in the high and low groups. The LA items predicted five cases in the low group (8.2% correct), two hundred and three in the medium group (97.1% correct) and four in the high group (8.0% correct). The LB items predicted three cases in the low group (4.9% correct), one hundred ninety seven in the medium group (94.3% correct) and seven in the high group (14.9% correct). The Likert items appear slightly more sensitive in attempting to predict cases in the high and low groups.

Table 20 lists the items contributing significantly to the discrimination when the items of the three scales are combined in the same analysis. Item one from the LA scale was selected as the most discriminating variable. None of the DAS items were selected as contributing significantly to the discrimination. Two items of the LA scale and three LB items contribute significantly to the discrimination of LA item one. From the combined analysis of the items, the LA and LB items are better than the DAS items in discriminating between the three groups.

From these results, hypothesis 5 was unable to be rejected in the present study. The three scales significantly discriminated between the three group centroids using the scale and item scores.

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In the combined analysis, using the items from each scale, the LA and LB items were better than the DAS items. From these results, the Likert scale offers only a slight advantage over the DAS scale.

No hypothesis was ventured for the religious affiliations reported by the subjects. Five discriminant analyses were conducted in a similar manner with this variable as those previously reported. The process is informative in nature rather than testing a hypothesis. The results of the five discriminant analyses will be briefly presented. The results of the analyses are presented in Appendix F.

The religious affiliations do not differ significantly in mean death anxiety scores for the three scales. In the five discriminant analyses, the discrimination was statistically significant. The LA scale was selected as the best discriminating scale. It offers only a slight advantage over the DAS and LB scales. Approximately the same number of items from each scale contribute to the discrimination (DAS - 6 items, LA and LB - 7 items). The LA items are able to discriminate along two discriminant functions compared to one discriminant function for the DAS and LB items. There was little difference between the items of the three scales together, each scale contributed approximately the same number of items to the discrimination (DAS - 5 items, LA - 4 items, LB - 6 items). Item DAS

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15 was chosen as the most discriminating item. These results suggest little difference between the three scales and their items.

Hypothesis 6

There is no significant difference among the DAS, LA, LB scales of death anxiety in the discriminability of their items.

This hypothesis was examined in two ways. The subjects from the first study were divided into high and low scores on each scale. A discrimination index was computed and converted into a point-biserial estimate for each item. The correlation estimates were compared across similar items to see if they improved in the Likert scales. The second examination of this hypothesis compared the results from the four discriminant analyses of the second study. This was undertaken to see if the LA scale and the items of the LA scale were better than the DAS scale and items in discriminating between subjects in the neutral and death salient scenarios.

The first procedure consisted of dividing the sample from the first study into high and low groups on each scale. This technique has been shown to produce similar results to those obtained from eighteen other discrimination indices (Oosterhof, 1976). The scores were ranked from

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lowest to highest and divided at the median. Scores, in the score interval where the median occurred, were assigned randomly to a high or low group as dictated by midpoint (given the probability of being assigned high or low). Thus, there were one hundred and sixty subjects in each group.

The number of subjects scoring an item in the direction indicative of death anxiety were tallied for the high and low groups for the items of the three scales. For the DAS item, the direction indicative of death anxiety simply corresponds with the scale's scoring key. For the LA item the direction indicative of death anxiety was set at Likert responses of five or above. The Likert responses were transformed into dichotomized variables by this method.

The discrimination index is computed in the following manner (guide for computation is presented in Appendix G). The number of subjects passing the item, i.e., scoring in direction indicative of death anxiety, in the high and low groups are divided by one hundred and sixty. This gives a ratio in the high and low groups of those passing the item. The ratio obtained by the low group is subtracted from the ratio of the high group. The result is a discrimination index. The discrimination index can then be converted to a point-biserial correlation estimate by using an abac (Guilford, 1954, p. 429).

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Table 21 presents the point-biserial correlation estimates for the items of the three scales. Eleven of the LA item correlation estimates were higher than that of the same DAS items. Four correlation estimates are significantly higher ($Z > 1.96$, $p < .05$). The significantly higher correlation estimates were obtained for items LA 1, 3, 7 and 10. Two items received the same correlation estimate and on the remaining two items, the DAS item correlation estimate was only slightly higher. Nine of the LB item correlation estimates were higher than the similar DAS items. Of those, four items (1, 7, 10 and 13) were significantly higher ($Z > 1.96$, $p < .05$). Six DAS items received higher correlation estimates than the LB item. In comparing the LA and LB items, there is no clear advantage of the items of one scale over another. The average point-biserial estimate is lower for the DAS items than the LA or LB items. Using the criterion of higher correlation estimates on at least two-thirds of the items as representing a significant improvement, these results suggest the LA items are better than the DAS items in discriminating between high and low scores.

A second study was designed in the present project to experimentally manipulate the level of death anxiety. Subjects were exposed to a neutral or death salient scenario

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and asked to role play the person described in the scenario. They were then administered the DAS and LA scales. The LB scale was not used in the second study as it did not represent a significant improvement upon the LA scale. A discriminant analysis approach was taken to compare the scores of the scales and their items to demonstrate the superiority of one scale over another. It was expected that the LA scale and the items of the LA scale would be better than the DAS scale and DAS items.

Four separate discriminant analysis programs were conducted. In the first discriminant analysis, the scores from the DAS and LA scales were used. The next two discriminant analyses used the scores of the items from each scale in separate analyses. The final discriminant analysis included the items of the four discriminant analyses are presented in Tables 22 through 24.

From the results of Table 22, the group exposed to the death salient scenario obtain higher mean scores on the DAS and LA scales than the group exposed to the neutral scenario. This difference is statistically significant for both scales (Table 23). These results suggest that the scenarios had a significant differential effect of the two groups. It can be said that the death salient scenario was effective in creating a death anxious situation.

Table 21

Point-biserial Correlation Estimates for the
Discrimination Indices of the DAS, LA and LB Items

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Avg r
DAS																
Scale	.50	.39	.48	.59	.48	.58	.45	.53	.45	.31	.43	.42	.47	.49	.47	.47
LA																
Scale	.61	.42	.56	.59	.55	.52	.61	.53	.50	.48	.45	.48	.46	.50	.50	.52
LB																
Scale	.62	.38	.50	.62	.40	.54	.68	.48	.58	.48	.58	.50	.68	.41	.20	.51

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The results from Table 23 indicate that in the four discriminant analyses the discrimination was statistically significant. The variables included in each of the four analyses were able to discriminate between the group centroids for the neutral and death salient scenarios.

In the first analysis there was only one stepdown procedure. The LA scale was selected as the best discriminating scale between the DAS and LA scales. Although both scales discriminate between the two groups, the LA scale appears to be better in this respect. The Wilks' lambda (Table 23) obtained for the LA scale (.570) is much lower than the Wilks' lambda obtained for the DAS scale (.744). Since the lower the Wilks' lambda, the greater the discrimination power of the scale and vice versa, it appears that the LA scale exhibited greater discrimination power. The Wilks' lambda values cannot be directly compared statistically. A test of the significance between two Wilks' lambda values can be conducted by comparing the F values associated with each Wilks' lambda (Ward, 1977). This can be done in the following manner.

since;

$$t = r \sqrt{\frac{N - 2}{1 - r^2}}$$

and;

$$t^2 = F$$

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therefore;

$$F = r^2 \left(\frac{N - 2}{1 - r^2} \right)$$

Using algebraic transformation;

$$r = \sqrt{\frac{F}{N - 2 + F}}$$

Using the above formula the r values for each F test can be compared using a Fisher's Z transformation. If a significant difference is found, there is a significant difference between the Wilks' lambda values.

The F value of 34.799 associated with the DAS Wilks' lambda value of .744 yielded an r of .458. The F value of 89.668 associated with the LA Wilks' lambda value of .570 yielded an r of .656. A Fisher's Z transformation yielded a non-significant value of 1.44. These results suggest that the LA scale offers a slight but non-significant advantage over the DAS scale in the discrimination power of the scale.

The items of the two scales significantly discriminate between the two groups. More items contribute to the discrimination in the LA scale than the DAS scale (Table 24). Ten LA items and eight DAS items contribute to the discrimination in the respective scales.

The Wilks' lambdas obtained for the items of the two scales can be compared in the same manner as the scales were.

Table 22

Number, Group Means and Standard Deviations for
Scenarios on the DAS and LA Scales from Second Study

	DAS Scale	LA Scale
<hr/>		
SCENARIO		
Neutral (59)	6.780	<u>Group Means</u> 58.153
Death Salient (62)	10.274	80.387
<hr/>		
SCENARIO		
Neutral	3.238	<u>Standard Deviations</u> 11.495
Death Salient	3.275	14.125
<hr/>		

Table 23

Univariate F-Tests for Scenarios on DAS and LA Scales
and Summary of the Discriminant Function Analyses for Scenarios

Scenario F-Tests							
		Wilks' Lambda	F	P			
DAS Scale		.774	34.799	.001			
LA Scale		.570	89.668	.001			

Scenario Discriminant Function Summary							
Analysis	Function	Relative Percentage	Canonical Correlation	Wilks' Lambda	Chi Square	df	P
DAS, LA Scales	1	100	.960	.078	302.46	1	.001
DAS Items	1	100	.693	.520	75.29	8	.001
LA Items	1	100	.787	.381	110.14	10	.001
DAS, LA Items	1	100	.826	.318	127.71	15	.001

Table 24

Standardized Discriminant Function Coefficients
for Scenario Discriminations

Function 1	
LA 7	.18
LA 1	.40
DAS 2	.15
DAS 4	-.30
LA 4	.18
DAS 3	.24
DAS 5	-.16
LA 5	.15
LA 9	.24
LA 11	-.14
LA 6	.16
LA 12	-.17
DAS 9	-.12
LA 2	.14
LA 13	-.08

Table 25

Scenario F-tests for the items of the DAS and LA Scales

ITEMS	DAS Scale	LA Scale
1	37.601	104.558
2	35.803	66.107
3	57.463	68.487
4	0.198	11.395
5	12.302	87.742
6	0.928	10.430
7	8.188	106.056
8	13.778	37.627
9	1.527	25.026
10	33.373	41.030
11	0.609	5.298
12	4.699	31.216
13	0.166	0.030
14	4.690	22.895
15	13.717	38.397

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The F ratios used in the comparison are presented in Table 25. Fisher's Z transformations were used to test for significance between r values for each item. LA items 5, 7 and 9 were found to be significantly more discriminating ($p < .05$) than DAS similar items. Since only three LA items were found to be better than DAS items the advantage of LA item discrimination has not been demonstrated.

The results of the discriminant analysis of the items of each scale were used to predict group membership. The DAS items correctly classified 49 neutral scenario subjects (83.1%) and 49 death scenario subjects (79.0%) for a total of 80.9% of cases correctly classified. The LA items did better, correctly classifying 56 neutral scenario subjects (94.9%) and 51 death scenario subjects (82.3%) for a total of 88.4% of cases correctly classified. The number of cases correctly classified for each group on the two scales were put into a 2x2 contingency table. A non-significant chi-square value was found. This suggests that although the LA items are able to correctly classify a greater percentage of cases, it is not significantly better at doing so than the DAS items. The high percentage of cases correctly classified, using the items of either scale, suggests that there is little overlap between the neutral and death scenario subjects.

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In the final discriminant procedure, the items of the DAS and LA scales were used in the same analysis. The items contributing significantly to the discrimination are listed in Table 24. The item selected as the most discriminating is LA 7. Nine LA items and five DAS items contribute significantly to the discrimination of item LA 7. The items that contribute most to the discriminant function are LA 1 and DAS 4.

It is interesting to note that three of the items selected from one scale are also selected from the other scale (items 4, 5 and 9). The only difference between the same item across the scales is in the manner they were scored, i.e., true or false for DAS or on a Likert scale.

A desirable point of information would be the number of discriminations between individuals a scale is making. Guilford (1954) has suggested formulas for computing the number of equality relations and difference relations between any two subjects in the sample. The theory underlying this operation is that individuals are discriminated from each other when they obtain different scores. If two individuals obtain the same score, there can be not discrimination between the two subjects. Thus, the relationship between the scores of any two subjects is one of equality or one of difference. The formulas for computing the number of equality and difference of relations

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are the following:

Equality Relations

$$\frac{\sum f^2 - \sum f}{2}$$

Difference Relations

$$\frac{(\sum f)^2 - \sum f^2}{2}$$

The term f is equal to the frequency of cases receiving each score. $\sum f$ is equal to the number in the sample.

In the first study the number of difference relations divided by the number of equality relations was 11.8 for the DAS scale. This means that for every pair of subjects receiving the same score, there were eleven pairs of subjects in which the subjects obtained different scores. The quotients obtained for the LA and LB scales were 44.2 and 44.6 respectively. For each pair of subjects receiving the same score on the LA and LB scale, almost four times as many pairs of subjects score differently than with the DAS scale. It can be said that the Likert scales have a potential, in the first study, of making four times as many discriminations between pairs of subjects than does the DAS scale.

In the second study, the results are even more dramatic. The quotient obtained for the DAS scale was 11.5 in contrast to 65.0 for the LA scale. Almost six times as many discriminations between individuals are possible with the LA scale.

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No hypothesis was ventured to pit one scale against another in the discrimination between individuals. The Likert scales would naturally be expected to make more discriminations because of its greater range of scores. The four-fold (first study) and six fold (second study) number of discriminations made with the LA scale over the DAS scale, clearly suggest that the LA scale offers an advantage over the DAS scale in discriminating between individuals.

From the results of the present study, hypothesis 6 was unable to be rejected. The expectations of the Likert scales being better than the DAS scale was not confirmed. The LB scale was not better than to the LA scale. In the first study, the point-biserial correlation estimates of the discrimination indices of the Likert items were highest for the majority of items. The Likert items were judged to be better than the DAS items in discriminating between high and low scorers. In the second study, however, the LA scale and items did not significantly improve upon the DAS scale and items with respect to discriminating between neutral subjects and death salient subjects. The LA items predicted a higher percentage of cases correctly but this did not represent a significant improvement. It was demonstrated that the LA scale is capable of making far more

discriminations between subjects than the DAS scale.

The results of testing the hypotheses will be briefly summarized.

Hypothesis 1

There is no significant difference among the DAS, LA, LB scales of death anxiety for reliability measures of internal consistency and test-retest reliability.

There were significant differences found between the reliability measures of internal consistency on the DAS, LA and LB scales. There were no significant differences in the test-retest reliabilities of the three scales found in the present study.

Hypothesis 2

There is no significant difference among the DAS, LA, LB scales of death anxiety and their correlations with the Marlowe-Crowne Scale.

There were no significant differences found in the correlations of the three death anxiety scales with the Marlowe-Crowne Scale in the present study.

Hypothesis 3

There is no significant difference among the DAS, LA, LB scales of death anxiety in their factor loadings on the primary factor of death anxiety and among the number of items from each scale loading on the primary factor of death anxiety.

There were no significant differences in the factor loadings on the primary factor of death anxiety from the DAS, LA and LB scales. There were significant differences in the number of

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items from each scale loading on the primary factor of death anxiety from the results obtained in the present study.

Hypothesis 4

There is no significant difference among the DAS, LA, LB scales of death anxiety for males and females.

There were no significant differences in the results obtained on the DAS, LA and LB scales by the different sexes.

Hypothesis 5

There is no significant difference among the DAS, LA, LB scales of death anxiety for self-perceived religiosity.

There were no significant differences in the results obtained on the DAS, LA and LB scales by different self-perceived religiosity groups.

Hypothesis 6

There is no significant difference among the DAS, LA, LB scales of death anxiety in the discriminability of their items.

There were no significant differences in the results obtained on the DAS, LA and LB scales when checked for discriminability of the items of each scale.

SUMMARY AND CONCLUSIONS

The review of the literature provided the basis for the current project. The main purpose of the study was to improve upon Templer's DAS instrument. Two scales were constructed to bring about improvement of the DAS. The LA scale used Templer's items in a Likert format. The LB scale changed the stems to a greater fear intensity level and were used in a Likert format. Two studies were conducted in the present project. The first study, involving a retest session, was a correlational study. The second study involved experimental manipulation of death anxiety levels. In the second study, subjects were exposed to a neutral or death salient scenario and asked to respond as if they were the person described in the scenario. Three hundred and twenty subjects participated in the first study and one hundred and twenty one in the second.

Whether the Likert scales improved upon the DAS scale was tested by six hypotheses. Two hypotheses had two sections, so there were essentially eight hypotheses. Six of the eight null hypotheses were unable to be rejected, suggesting that there was no difference between the three scales and/or their items. Two of the null hypotheses were rejected, suggesting an advantage of the Likert scales and/or their items.

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In the present study, the Likert version of Templer's DAS scale (LA scale) is considered from the results of the hypotheses testing to offer advantages over Templer's original scale for at least two important reasons. The internal consistency of the DAS scale was significantly improved upon in a Likert format. The Likert scale is capable of making a greater number of discriminations between individuals.

Those results where no significant results were found are nevertheless encouraging in advocating the use of a Likert version of the DAS. The results of the LA scale and items were demonstrated to be on par with the DAS scale and items.

The test-retest reliability was respectable. The Likert version correlated in a similar manner with the Marlowe-Crowne Scale. From the principal axes factor analyses, the Likert and DAS scales and items loaded on the same factors in a similar manner. Females scored significantly higher on the Likert version as expected. Those high and low in self-perceived religiosity were significantly different from those medium yet not significantly different from each other.

In summarizing the results of this study, the failure of the changing of the item stems to bring about a significant degree of improvement should be noted. In those situations where the LA scale or LA items were demonstrated to be better than the DAS scale or items, the LB scale or

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items were usually also better. There did not appear to be any difference between the LA and LB scales or the items of the two scales. In this project, the higher fear appeal wording of the items had no significant effect. In trying to account for the failure of the LB items to improve upon Templer's original items, it may be that with the subject of death as a stimulus in the items, Templer's items have reached their asymptotic value of producing anxiety.

A major contribution of the present study is that the LA scale was found to significantly improve upon the internal consistency of Templer's scale. To justify the summation of the responses to the items a high degree of interrelatedness between the items is necessary. "A test should 'hang together' in the sense that the items should all correlate with one another. Otherwise, it makes little sense to add scores over items and speak of total scores measuring any attribute" (Nunnally, 1967, p.251). Using a Likert format in the LA scale a satisfactory level of internal consistency has important implications for the validity of the scale. Simply stated, an inaccurate test often cannot be a good predictor. The accuracy of Templer's scale was improved using the Likert format. Caution is urged in generalizing beyond this limited study, however. It appears that the Likert version of the DAS scale offers researchers

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a better instrument of death anxiety. With a better instrument, more confidence can be placed in future research and the understanding of the variable of death anxiety increased.

The LA scale was found to have an acceptable test-retest reliability. Some evidence for the content and construct validity of the LA scale was obtained by testing several hypotheses. Evidence for the convergent and discriminant validity of the LA scale was demonstrated. Support for the concurrent validity of the LA scale was obtained in the two studies. The LA scale was shown to be related to response set in a similar manner as the DAS. It should be pointed out that the above findings are also applicable to the DAS scale which strengthens the case for considering the DAS to be a reliable and valid measure of death anxiety. The advantages of the LA scale over the DAS is suggested because of higher internal consistency and the scale is capable of making a greater number of discriminations between individuals.

A theoretical contribution was made, which received some empirical support. The contribution was that the strength of one's belief system is a crucial determinant in one's level of death anxiety. Stolorow (1973) stated "existentialist writers, whether 'atheistic' or 'religious' agree that authentically 'moving through' death anxiety, taking the dread of nonbeing upon oneself, contributes

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to self-growth and a heightened sense of Being" (p. 483). This statement suggests that the orientation of the belief system is less important than the perceptions that the individual has. Smith (1977) reported that people who showed little conflict within themselves exhibited less death anxiety. It would appear logical to hypothesize that individuals who have little internal conflict have a strong belief system. Templer and Ruff (1975) found that psychiatric patients who had changed their religion had higher death anxiety levels than other psychiatric patients. In this study, it might be logical to question the strength of one's belief system who has been converted from their original religious teachings. Schulz (1977) believes that increased death anxiety is positively related to a structural breakdown of a cognitive whole i.e., cognitive map of the topic of death. This view is compatible with the strength of one's belief system assumption. It is clear that some studies have found lower death anxiety with "religious" subjects while other studies have found low death anxiety associated with "non-religious" subjects. A possible explanation is that the strength of the belief system is the important determinant in the level of death anxiety. This assumption and preliminary findings from the current study appear to merit further research and consideration.

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Before considering suggestions for further research, it would be appropriate to present the shortcomings of the present project. The sample consisted of a restricted population i.e., college students. There was not a wide sampling from different age ranges. The design of this study led to using Templer's fifteen items. Ideally a larger number of items could have been used. Using the .84 internal consistency reliability from the first study with the LA scale, this could have been improved upon. Using the Spearman-Brown prophecy formula, if the LA scale was increased to twenty items, the reliability would be .88 and if increased to twenty-five items .90. In the second study, reliabilities for the LA scale would have increased to .93 for twenty items and .94 for twenty-five items. The results of the principal axes factor analyses could have been used to generate new items to be tested with a new sample. The unequal number of subjects in classification categories was a weakness in the present project. More confidence can be placed in results where large number of subjects are used with the same number in each group. The manipulation of death anxiety was contrived for the purpose of this study. The use of "known groups" is seen as being more advantageous.

Some suggestions for further research are the following:

1. More comparative research comparing the merits of the Likert version of the DAS (LA Scale) and the DAS.

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2. Adding new items to the LA scale in a reliability and validity study.
3. Additional empirical research to further establish the reliability and validity of the LA scale in its present format.
4. Using the LA scale with different populations, different ages, and subjects known to be high in death anxiety.
5. Further investigation of the theory that strength of one's belief system is a crucial determinant in one's level of death anxiety.

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APPENDIX A

SCALES USED IN THE STUDY

APPENDIX A

DAS SCALE

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DIRECTIONS: This form contains a series of statements. Read each one, decide how you feel about it and then mark your answer next to the statement. If you agree with a statement, or feel that it is true about you, circle T for TRUE. If you disagree with a statement, or feel that it is not true about you, circle F for FALSE. Please answer all items.

1. T F I am very much afraid to die.
2. T F The thought of death seldom enters my mind.
3. T F It doesn't make me nervous when people talk about death.
4. T F I dread to think about having to have an operation.
5. T F I am not at all afraid to die.
6. T F I am not particularly afraid of getting cancer.
7. T F The thought of death never bothers me.
8. T F I am often distressed by the way time flies so very rapidly.
9. T F I fear dying a painful death.
10. T F The subject of life after death troubles me greatly.
11. T F I am really scared of having a heart attack.
12. T F I often think about how short life really is.
13. T F I shudder when I hear people talking about a World War III.
14. T F The sight of a dead body is horrifying to me.
15. T F I feel that the future holds nothing for me to fear.

LA SCALE

DIRECTIONS: This form contains a series of statements. Read each one, decide how you feel about it and put an X on the line below to indicate how you feel about it. If you cannot make up your mind about a statement put an X next to undecided. Try to use the undecided and neutral ratings as little as possible. Please answer all items.

Example

A. I enjoy reading novels.

Very Strongly	Strongly	Agree	Neutral	Disagree	Strongly	Very Strongly
Agree	Agree				Disagree	Disagree

___ Undecided

1. I am very much afraid to die.

Very Strongly	Strongly	Disagree	Neutral	Agree	Strongly	Very Strongly
Disagree	Disagree				Agree	Agree

___ Undecided

2. The thought of death seldom enters my mind.

Very Strongly	Strongly	Agree	Neutral	Disagree	Strongly	Very Strongly
Agree	Agree				Disagree	Disagree

___ Undecided

3. It doesn't make me nervous when people talk about death.

Very Strongly	Strongly	Agree	Neutral	Disagree	Strongly	Very Strongly
Agree	Agree				Disagree	Disagree

___ Undecided

4. I dread to think about having to have an operation.

Very Strongly	Strongly	Disagree	Neutral	Agree	Strongly	Very Strongly
Disagree	Disagree				Agree	Agree

___ Undecided

5. I am not at all afraid to die

Very Strongly	Strongly	Agree	Neutral	Disagree	Strongly	Very Strongly
Agree	Agree				Disagree	Disagree

___ Undecided

6. I am not particularly afraid of getting cancer.

Very Strongly Agree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Very Strongly Disagree
---------------------	----------------	-------	---------	----------	-------------------	------------------------

___ Undecided

7. The thought of death never bothers me.

Very Strongly Agree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Very Strongly Disagree
---------------------	----------------	-------	---------	----------	-------------------	------------------------

___ Undecided

8. I am often distressed by the way time flies so rapidly.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

9. I fear dying a painful death.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

10. The subjects of life after death troubles me greatly.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

11. I am really scared of having a heart attack.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

12. I often think about how short life really is.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

13. I shudder when I hear people talking about World War III.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree

___ Undecided

14. The sight of a dead body is horrifying to me.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree

___ Undecided

15. I feel the future holds nothing for me. to fear.

Very Strongly Agree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Very Strongly Disagree

___ Undecided

A. I enjoy reading novels.

Very Strongly Agree **X** Strongly Agree Agree Neutral Disagree Strongly Disagree Very Strongly Disagree

Undecided

1. I am extremely afraid to die.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
Undecided						

2. The thought of my own death never enters my mind.

Very Strongly Agree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Very Strongly Disagree
Undecided						

3. To talk about my death would not bother me at all.

Very Strongly Agree Strongly Agree Agree Neutral Disagree Strongly Disagree Very Strongly Disagree

Undecided

4. I would be extremely fearful to have a serious operation.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
Undecided						

5. I am looking forward to death.

Very Strongly Agree Strongly Agree Agree Neutral Disagree Strongly Disagree Very Strongly Disagree

Undecided

6. I am not terrified of getting cancer.

Very Strongly Agree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Very Strongly Disagree
---------------------	----------------	-------	---------	----------	-------------------	------------------------

___ Undecided

7. The thought of my death does not bother me.

Very Strongly Agree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Very Strongly Disagree
---------------------	----------------	-------	---------	----------	-------------------	------------------------

___ Undecided

8. I am frightened by the way life races by.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

9. I am greatly afraid of dying a painful death.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

10. The subject of life after death scares me greatly.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

11. I am terrified of having a heart attack.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

12. Death will come too soon to me.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
------------------------	-------------------	----------	---------	-------	----------------	---------------------

___ Undecided

13. I am terrified of being involved in World War III.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
---------------------------	----------------------	----------	---------	-------	-------------------	------------------------

___ Undecided

14. I could not touch a dead body.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
---------------------------	----------------------	----------	---------	-------	-------------------	------------------------

___ Undecided

15. There is nothing in the future for me.

Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
---------------------------	----------------------	----------	---------	-------	-------------------	------------------------

___ Undecided

APPENDIX A

MARLOWE-CROWNE SCALE

- T F 1. Before voting I thoroughly investigate the qualifications of all the candidates.
- T F 2. I never hesitate to go out of my way to help someone in trouble.
- T F 3. It is sometimes hard for me to go on with my work if I am not encouraged.
- T F 4. I have never intensely disliked anyone.
- T F 5. On occasion I have had doubts about my ability to succeed in life.
- T F 6. I sometimes feel resentful when I don't get my way.
- T F 7. I am always careful about my manner of dress.
- T F 8. My table manners at home are as good as when I eat out in a restaurant.
- T F 9. If I could get into a movie without paying and be sure I was not seen I would probably do it.
- T F 10. On a few occasions, I have given up doing something because I thought too little of my ability.
- T F 11. I like to gossip at times.
- T F 12. There have been times when I felt like rebelling against people in authority even though I knew they were right.
- T F 13. No matter who I'm talking to, I'm always a good listener.
- T F 14. I can remember "playing sick" to get out of something.
- T F 15. There have been occasions when I took advantage of someone.

APPENDIX A
MARLOWE CROWNE SCALE

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- T F 16. I'm always willing to admit it when I make a mistake.
- T F 17. I always try to practice what I preach.
- T F 18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people.
- T F 19. I sometimes try to get even rather than forgive and forget.
- T F 20. When I don't know something I don't at all mind admitting it.
- T F 21. I am always courteous, even to people who are disagreeable.
- T F 22. At times I have really insisted on having things my way.
- T F 23. There have been occasions when I felt like smashing things.
- T F 24. I would never think of letting someone else be punished for my wrong-doings.
- T F 25. I never resent being asked to return a favor.
- T F 26. I have never been irked when people expressed ideas very different from my own.
- T F 27. I never make a long trip without checking the safety of my car.
- T F 28. There have been times when I was quite jealous of the good fortune of others.
- T F 29. I have almost never felt the urge to tell someone off.
- T F 30. I am sometimes irritated by people who ask favors of me.
- T F 31. I have never felt that I was punished without cause.
- T F 32. I sometimes think when people have a misfortune they only got what they deserved.
- T F 33. I have never deliberately said something that hurt someone's feelings.

APPENDIX A

GENERAL INFORMATION

In order to evaluate this survey some background information is needed. Please help by answering these questions.

What is your sex? ☐ Male ☐ Female

What is your age in years? _____

What is your religion? (please specify) _____ None _____

How religious do you consider yourself? (please check an answer below)

- ☐ Extremely religious
- ☐ Very religious
- ☐ Somewhat religious
- ☐ Slightly religious
- ☐ Not at all religious
- ☐ Antireligious

APPENDIX A

SURVEY PAGE

Did you answer the questions truthfully?

Did you do any thinking about the questions on the first questionnaire in the last three weeks?

How did you feel about the questionnaire?

Did you find taking the questionnaire upsetting?

Comments:

APPENDIX B

ADDITIONAL FACTOR MATRICES OF
THE THREE SCALES

Unrotated Factor Matrix of DAS Items

Item	1	2	3	4	5
1	.50	-.08	.07	-.02	.01
2	.32	-.06	.28	-.17	.14
3	.51	.14	-.04	.21	-.07
4	.56	.10	-.26	.05	-.21
5	.47	-.45	.14	.05	-.01
6	.56	-.04	-.21	-.33	.14
7	.44	-.38	.23	.09	.03
8	.45	.47	.30	.13	-.04
9	.39	-.01	-.11	.13	-.19
10	.28	.21	-.12	-.25	.39
11	.43	.11	-.37	-.01	.15
12	.38	.52	.30	-.17	-.02
13	.40	.12	-.13	.05	-.12
14	.44	.00	-.01	.27	-.10
15	.34	-.23	.13	-.14	.09
Percentage of Common Variance	23.5	10.5	8.3	7.1	6.7
Cumulative %	23.5	33.9	42.3	49.3	56.1

Unrotated Factor Matrix of LA Items

Item	1	2	3	4
1	.75	-.15	-.13	-.10
2	.30	-.08	-.10	.57
3	.59	-.12	-.08	-.08
4	.62	.04	.23	-.05
5	.70	-.23	-.29	-.21
6	.55	-.14	.24	.09
7	.67	-.23	-.29	.12
8	.53	.71	-.20	-.06
9	.46	.01	.35	.05
10	.44	.07	-.04	-.04
11	.56	.02	.38	-.04
12	.38	.56	-.06	.13
13	.48	.03	.25	-.01
14	.43	-.05	-.05	-.10
15	.41	-.11	-.07	.14
Percentage of Common Variance	32.7	9.2	8.2	7.1
Cumulative %	32.7	41.9	50.1	57.2

Unrotated Factor Matrix of LB Items

Item	1	2	3	4
1	.72	.11	-.04	.12
2	.21	-.02	-.10	.40
3	.59	.39	-.05	.01
4	.65	-.11	-.06	.02
5	.21	.25	-.35	-.30
6	.57	-.34	-.22	.03
7	.81	.29	-.24	.18
8	.52	.03	.23	-.11
9	.55	-.42	-.02	.05
10	.64	.18	.43	-.02
11	.60	-.32	.06	-.08
12	.42	.05	-.03	-.13
13	.61	-.23	.03	-.21
14	.43	.19	.15	-.07
15	.08	.02	.31	.14
Percentage of Common Variance	32.8	9.1	8.4	7.3
Cumulative %	32.8	41.9	50.3	57.6

Varimax Rotated Factor Matrix for the DAS Items

Item	1	2	Factors 3	4	5	h^2
1	.36	.27	.15	.19	.09	.27
2	.42	.04	.23	-.05	.04	.23
3	.28	.26	.03	.42	.12	.33
4	.06	.58	.14	.24	.05	.43
5	.58	.13	-.10	.29	-.02	.45
6	.35	.55	.07	-.10	.19	.48
7	.56	.04	-.02	.29	.00	.40
8	.05	.10	.65	.25	.15	.52
9	.15	.41	.09	.12	-.07	.22
10	.02	.07	.13	.12	.56	.35
11	.04	.47	.01	.07	.37	.36
12	.05	.18	.70	-.03	.05	.53
13	.04	.36	.15	.23	.08	.21
14	.14	.19	.12	.44	.12	.28
15	.44	.13	.03	.02	.01	.21
Percentage of Common Variance	54.6	19.1	12.1	7.8	6.4	
Cumulative %	54.6	73.7	85.9	93.6	100%	

APPENDIX B

Varimax Rotated Factor Matrix for the LA Items

Item	Factors				h ²
	1	2	3	4	
1	.68	.34	.14	.11	.61
2	.12	.09	.07	.64	.43
3	.53	.29	.10	.09	.38
4	.32	.55	.20	.05	.44
5	.80	.18	.08	.03	.68
6	.29	.52	.00	.19	.39
7	.68	.16	.08	.34	.60
8	.23	.13	.87	-.03	.82
9	.13	.55	.09	.10	.34
10	.33	.22	.22	.05	.21
11	.20	.63	.12	.02	.46
12	.06	.16	.66	.13	.48
13	.21	.48	.14	.05	.30
14	.38	.22	.10	.01	.20
15	.33	.18	.06	.26	.21
Percentage of Common Variance					
	66.9	15.3	10.5	7.2	
Cumulative %					
	66.9	82.3	92.8	100%	

Varimax Rotated Factor Matrix for the LB Items

Item	Factors				h ²
	1	2	3	4	
1	.54	.38	.32	.05	.55
2	.04	.10	.44	-.08	.21
3	.65	.11	.23	.16	.50
4	.37	.50	.21	.05	.44
5	.25	.02	-.04	.50	.32
6	.12	.64	.23	.13	.49
7	.66	.30	.50	.29	.84
8	.47	.31	-.04	-.12	.34
9	.11	.66	.16	-.07	.48
10	.69	.26	.00	-.29	.62
11	.25	.64	.04	-.06	.47
12	.34	.25	.02	.12	.19
13	.32	.60	-.05	.04	.47
14	.47	.14	.01	-.03	.24
15	.13	-.01	.02	-.32	.12
Percentage of Common Variance					
	70.6	13.4	9.6	6.4	
Cumulative %					
	70.6	84.0	93.6	100%	

APPENDIX C

FACTOR MATRICES OF THE ITEMS OF
SCALES USED IN SECOND STUDY

Varimax Rotated Factor Matrix for DAS Items in the Second Study

Item	Factors					h ²
	1	2	3	4	5	
1	.70	.24	.24	.07	.15	.63
2	.42	-.09	.17	.42	.00	.39
3	.86	.00	.15	.19	.22	.85
4	.13	.45	.01	-.14	.26	.32
5	.38	.06	.08	.39	.13	.32
6	.09	.42	.04	.12	.07	.21
7	.04	.03	.06	.71	.54	.79
8	.31	.06	.87	.16	.09	.89
9	.13	.27	.16	.43	-.11	.31
10	.57	.18	.21	.14	.02	.42
11	.26	.82	-.04	.14	-.15	.79
12	.29	.15	.54	.15	.02	.42
13	-.05	.40	.14	.00	.03	.18
14	.45	.34	.25	-.03	.23	.43
15	.16	.05	.04	.07	.44	.23
Percentage of Common						
Variance	56.0	16.8	11.4	9.2	6.5	
Cumulative						
%	56.0	72.8	84.3	93.5	100%	

Varimax Rotated Factor Matrix for LA Items in the Second Study

Item	Factors		h^2
	1	2	
1	.82	-.26	.74
2	.67	-.20	.49
3	.82	-.19	.71
4	.50	.22	.30
5	.82	-.20	.71
6	.51	.52	.53
7	.86	-.22	.79
8	.74	.03	.54
9	.54	.16	.32
10	.78	-.02	.61
11	.57	.50	.57
12	.76	-.02	.57
13	.32	.37	.24
14	.68	.04	.47
15	.65	-.02	.42
Percentage of Common Variance			
	87.9	12.1	
Cumulative %			
	87.9	100%	

Oblique Factor Matrix for the DAS Items in the Second Study

Item	Pattern Matrix					Structure Matrix					h ²
	1	2	3	4	5	1	2	3	4	5	
1	.66	.13	-.06	.17	.13	.75	.34	.24	.50	.16	.63
2	.41	-.10	.21	.12	-.25	.51	.03	.39	.34	-.26	.39
3	.89	-.10	.06	.05	.09	.91	.14	.38	.45	.10	.85
4	.07	.39	.02	-.02	.34	.17	.44	.07	.13	.39	.32
5	.37	.04	.29	.01	-.11	.48	.16	.43	.28	-.11	.32
6	.03	.43	.09	.00	.01	.16	.44	.15	.16	.06	.21
7	-.07	.03	.90	.04	.00	.28	.13	.89	.25	-.04	.79
8	.03	-.12	.02	.95	.01	.46	.18	.27	.94	-.02	.89
9	.06	.31	.20	.12	.32	.26	.35	.30	.30	-.30	.31
10	.55	.11	-.06	.14	-.03	.62	.28	.20	.42	.00	.42
11	.23	.87	-.11	-.14	-.15	.33	.85	.05	.20	-.04	.79
12	.12	.05	.00	.57	-.05	.40	.24	.20	.64	-.05	.42
13	-.15	.39	.00	.14	.04	.00	.40	.02	.19	.08	.18
14	.36	.23	-.03	.21	.24	.51	.40	.17	.44	.28	.43
15	.11	-.01	.31	.01	.32	.23	.09	.34	.13	.31	.23
Percentage of Common Variance						Factor Correlations					
56.0						1					
16.8						2	.24				
11.4						3	.36	.12			
9.2						4	.47	.30	.26		
6.5						5	.02	.11	-.04	-.01	
Cumulative %											
56.0											
72.8											
84.3											
93.5											
100%											

Oblique Factor Matrix for the LA Items in the Second Study

Item	Pattern Matrix		Structure Matrix		h ²
	1	2	1	2	
1	.93	-.13	.86	.39	.74
2	.75	-.10	.70	.32	.49
3	.88	-.04	.84	.44	.71
4	.25	.37	.45	.50	.30
5	.88	-.07	.84	.42	.71
6	.00	.73	.41	.73	.53
7	.93	-.08	.89	.44	.79
8	.61	.19	.72	.53	.54
9	.33	.31	.50	.49	.32
10	.69	.14	.78	.53	.61
11	.07	.71	.47	.75	.57
12	.67	.14	.75	.52	.57
13	-.04	.51	.24	.49	.24
14	.56	.19	.66	.50	.47
15	.58	.11	.64	.44	.42
Percentage of Common Variance			Factor Correlations		
87.9			1	2	.56
Cumulative					
87.9			100%		

Unrotated Factor Matrix of DAS Items in the Second Study

Item	Factors				
	1	2	3	4	5
1	.75	.04	-.17	-.20	.03
2	.49	-.29	.08	-.03	-.24
3	.80	-.22	-.12	-.39	-.04
4	.27	.38	.05	-.08	.30
5	.50	-.15	.18	-.08	-.12
6	.29	.31	.16	.06	.01
7	.45	-.32	.68	.11	.15
8	.69	-.23	-.31	.49	.13
9	.39	.08	.21	.21	-.26
10	.62	.01	-.13	-.13	-.10
11	.48	.71	.14	.01	-.21
12	.55	-.06	-.18	.29	.01
13	.17	.33	.05	.19	.08
14	.59	.17	-.12	-.07	.19
15	.27	-.08	.17	-.12	.32
Percentage of Common Variance	29.7	11.3	8.1	7.6	6.7
Cumulative %	29.7	41.0	49.1	56.8	63.5

Unrotated Factor Matrix of LA Items in the Second Study

Item	Factors	
	1	2
1	.82	-.26
2	.67	-.20
3	.82	-.19
4	.50	.22
5	.82	-.20
6	.51	.52
7	.86	-.22
8	.74	.03
9	.54	.16
10	.78	-.02
11	.57	.50
12	.76	-.02
13	.32	.37
14	.68	.04
15	.65	-.02
Percentage of Common		
Variance	49.7	9.8
Cumulative		
%	49.7	59.5

APPENDIX D

ADDITIONAL FACTOR MATRIX OF THE
ITEMS OF THE THREE SCALES USED
IN THE SAME ANALYSIS


APPENDIX D

Varimax Rotated Factor Matrix for DAS, LA and
LB Items Loading Above Criterion on the First Five Factors

Item	1	2	3	4	5
DAS 1	.35				
3	.36		.36		
5	.63				
7	.59				
8		.70			
11				.66	
12		.70			
13					
DAS 14			.73		
LA 1	.56				.78
3	.44		.38		
5	.77				
7	.73				
8		.80			
11				.82	
12		.77			
13					.85
LA 14			.89		
LB 1	.53				
3	.60		.31		
7	.71				
8		.70			
11				.82	
12	.32	.32			
13					.54
LB 14			.71		
Percentage of Common Variance	42.8	10.0	9.1	7.0	5.4
Cumulative %	42.8	52.9	62.0	69.0	74.5

APPENDIX E

FACTOR MATRICES AND COMMUNALITIES OF
THE SCALES USED IN THE SECOND STUDY

The page contains two handwritten marks. One is a large, open, curved line on the right side, resembling a 'C' or a checkmark. The other is a more complex, tangled scribble in the lower-left quadrant.

Item	1	2	3	4
DAS 1	.61			
2	.40			
3	.60			
5	.37			
6		.62		
7			.30	
10	.56			
11		.70		
13				.67
DAS 15			.73	
LA 1	.85			
2	.60			
3	.80			
4	.31			
5	.75			
6		.65		
7	.80			
8	.59			
10	.74			
11		.62		
12	.64			
13				.89
14	.57			
15	.43		.81	
Percentage of Common Variance	51.6	11.7	8.1	6.8
Cumulative %	51.6	63.3	71.4	78.2

APPENDIX F

Oblique Factor Matrix for the DAS and LA Items Loading
Above Criterion on the First Four Factors of the Second Study

Item	Pattern Matrix				Structure Matrix			
	1	2	3	4	1	2	3	4
DAS 1	.47				.64			
2	.56				.56			
3	.50			-.31	.60			-.51
4	.53				.56			
5		.64				.66		
6			-.33				-.38	
7				-.33				-.49
8		.67				.72		
9				-.81				-.85
10							-.78	
DAS 11			-.82					
LA 1	.72				.83			
2	.58				.73			
3	.65				.79			
4	.70				.83			
5		.58				.71		
6					.85			
7	.69				.63			-.51
8	.63			-.30				
9		.53				.66		
10				-.56				-.70
11							-.93	
LA 12			-.90					
Percentage of Common Variance					Factor Correlations			
51.6					1			
11.7					2	.19		
8.1					3	-.46	-.16	
6.8					4	-.29	-.13	.12
Cumulative %								
51.6								
63.3								
71.4								
78.2								

APPENDIX E

The Communalities Obtained in the Principal Axes
Factor Analysis of the DAS and LA Items of the Second Study

Item	DAS Scale	LA Scale
1	.59	.81
2	.57	.68
3	.67	.75
4	.79	.63
5	.46	.76
6	.48	.62
7	.43	.79
8	.61	.69
9	.75	.69
10	.54	.77
11	.68	.65
12	.60	.81
13	.52	.87
14	.78	.68
15	.62	.89

APPENDIX F

RELIGIOUS AFFILIATION CHARACTERISTICS AND
SUMMARY OF DISCRIMINANT FUNCTION ANALYSIS

Univariate F-Tests for Religion on the Three
Death Anxiety Scales and Summary of the
Discriminant Function Analysis for Religion

	Religion F-Tests		
	Wilks' Lambda	F	P
DAS Scale	.980	2.125	.095
LA Scale	.978	2.351	.065
LB Scale	.983	1.803	.145

Religion Discriminant Function Summary							
Analysis		Function Percentage	Canonical Correlations	Wilks' Lambda	Chi Square	df	P
DAS, LA, LB Scales	1	100	.524	.726	101.58	3	.00
DAS Items	1	67.14	.264	.897	34.07	18	.01
	2	17.60	.139	.964	11.40	10	ns
	3	15.27	.129	.983	5.30	4	ns
LA Items	1	49.08	.267	.859	47.70	21	.00
	2	39.81	.243	.925	24.43	12	.01
	3	11.11	.131	.983	5.42	5	ns
LB Items	1	67.95	.329	.843	53.44	21	.00
	2	23.18	.199	.945	17.61	12	ns
	3	8.88	.125	.984	4.92	5	ns
DAS, LA, LB Items	1	50.07	.375	.735	95.43	45	.00
	2	31.07	.304	.855	48.49	28	.00
	3	18.88	.241	.942	18.53	13	ns

APPENDIX F

Number, Group Means and Standard Deviations for
Religion on the DAS, LA and LB Scales

	DAS Scale	LA Scale	LB Scale
RELIGION	<u>Group Means</u>		
Catholic (180)	7.217	61.550	60.083
Protestant (90)	6.356	57.800	56.400
Other (9)	5.333	54.222	55.389
None (41)	6.707	58.390	58.263
RELIGION	<u>Standard Deviations</u>		
Catholic	3.286	13.521	12.669
Protestant	3.113	12.541	13.282
Other	3.905	19.195	15.293
None	3.319	12.755	12.460

APPENDIX G
DISCRIMINATION INDEX

Refer to page 1 for explanation.

APPENDIX G

Discrimination Index

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
High	72	114	63	96	148	129	148	114	140	30	54	121	96	74	125
	450	713	394	600	925	806	925	713	875	188	338	756	600	463	781
Low	12	65	12	19	85	49	96	41	89	5	9	67	37	17	67
	075	406	075	119	531	306	600	256	556	031	056	419	231	106	419
	375	307	319	481	394	500	325	457	319	157	232	337	369	357	362

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
High	111	131	85	113	149	132	156	131	151	75	83	132	117	104	129
	694	819	531	706	931	825	975	819	944	469	519	825	731	650	806
Low	23	78	15	30	83	64	90	59	93	17	26	73	56	37	65
	144	488	094	188	519	400	563	369	581	109	163	456	350	231	406
	550	331	437	518	412	425	412	450	363	363	356	369	381	419	400

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
High	101	152	114	137	158	136	150	111	152	57	95	126	150	79	155
	631	950	713	856	988	850	938	694	950	356	594	788	938	494	031
Low	17	119	45	46	135	65	51	48	84	8	20	60	53	29	2
	106	774	281	288	844	406	319	300	525	050	125	375	331	181	013
	525	206	432	568	144	144	619	394	425	306	469	413	607	313	018

APPENDIX H

ABSTRACT OF

Improving the Measurement of Death Anxiety

APPENDIX H

ABSTRACT OF

Improving the Measurement of Death Anxiety

The main purpose of the project was to improve upon the reliability and validity of Templer's Death Anxiety Scale. The project consisted of two separate studies.

For the first study, two scales were developed using Templer's items in a Likert format (LA Scale) and changing the item stems in a Likert format (LB Scale). The three death anxiety scales and the Marlowe-Crowne Scale were administered to 320 subjects. Demographic data and a rating of self-perceived religiosity were obtained. The three death anxiety scales were administered to 281 subjects three weeks later in a retest session.

The internal consistency and test-retest reliabilities of the death anxiety scales were compared. Variables used to explore construct validity were sex, religiosity, Marlowe-Crowne Scale. Also, the scale and item scores were used in factor analysis procedures to explore construct validity. High and low scorers for the items of each scale were compared to explore concurrent validity.

The results of the first study suggest that there is little difference between the LA and LB scales. The Likert scales were superior to the DAS in terms of internal

APPENDIX H

consistency of the scale. The scales appeared to be similar with respect to convergent and discriminant validity. Circumstantial evidence supported the content validity of the three scales. The Likert items were superior in discriminating between high and low scorers than the DAS items. No significant difference was noted between the scales for test-retest reliability, sex and religiosity. The factor analyses of the scales and their items, not surprisingly, showed that there was little difference between the scales and their items. The LA scale items did, however, define a primary factor of death anxiety better than the items of the other two scales by loading more items above criterion on that factor. The primary factor was named using the Delphi method.

A second study was conducted to introduce an external criterion of death anxiety. A neutral and a death salient scenario were developed by this writer. The subjects were asked to role play the person described in one of the two scenarios. The DAS and LA scales were then administered to the 121 subjects who participated in the second study.

The results of the second study suggest that the LA scale and the LA items were not superior to the DAS scale and items in discriminating between the subjects in the neutral and death salient scenarios. A demonstration was

APPENDIX H

made of the ability of the LA scale to make a greater number of discriminations between pairs of subjects than the DAS scale for the results of both studies.

The conclusion of the project is that the DAS scale in Likert form (LA scale) offers advantages over the DAS scale in true-false form. Most importantly, significant improvement was made in the internal consistency of the scale. The LA scale is seen as having clinical utility by providing finer response distinctions and a greater range of scores. This would enable the test user to determine change in individual subject's level of death anxiety with more precision than the current fifteen item True-false format.