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**State-Trait Anxiety Inventory
for Adults
Sampler Set
Manual, Instrument and Scoring Guide**

Developed by Charles D. Spielberger

in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

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Tampa, Florida
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Charles D. Spielberger

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Self Evaluation Questionnaire Test Booklet

Scoring Key

I. Introduction

The twentieth century has been called the Age of Anxiety, but concerns about fear and anxiety are as old as humanity itself. Although fear has been of interest since ancient times, anxiety was not fully recognized as a distinct and pervasive human condition until shortly before the beginning of the present century. It was Freud who first proposed a critical role for anxiety in personality theory and in the etiology of psychoneurotic and psychosomatic disorders. Anxiety was the “fundamental phenomenon and the central problem of neurosis” (Freud, 1836, p.85). For Freud, anxiety was “something felt” — a specific unpleasant emotional state or condition of the human organism that included experiential, physiological, and behavioral components.

Over the past fifty years, clinical studies of human anxiety have appeared in the psychiatric and psychoanalytic literature with increasing regularity, but prior to 1950 there was relatively little research on human anxiety (Spielberger, 1966). The complexity of anxiety phenomena, the ambiguity and vagueness in theoretical conceptions of anxiety, the lack of appropriate measuring instruments, and ethical problems associated with inducing anxiety in laboratory settings, all contributed to the paucity of research.

Since 1950, research on human anxiety has been facilitated on two fronts. Conceptual advances have clarified anxiety as a theoretical construct, and a number of scales have been created for measuring anxiety. The term *anxiety* is currently used to refer to at least two related, yet logically quite different, constructs. Empirically, anxiety is perhaps most often used to describe an unpleasant emotional state or condition. Anxiety is also used to describe relatively stable individual differences in anxiety-proneness as a personality trait.

I.a. State and Trait Anxiety

The concepts of state and trait anxiety were first introduced by Cattell (1966; Cattell & Scheier, 1961, 1963) and have been elaborated by Spielberger (1966, 1972, 1976, 1979). In general, personality states may be regarded as temporal cross sections in the stream-of-life of a person (Thorne, 1966), and emotional reactions as expressions of personality states (Spielberger, 1972). An emotional state exists at a given moment in time and at a particular level of intensity. Anxiety states are characterized by subjective feelings of tension, apprehension, nervousness, and worry, and by activation or arousal of the autonomic nervous system.

Although personality states are often transitory, they can recur when evoked by appropriate stimuli; and they may endure over time when the evoking conditions persist. In contrast to the transitory nature of emotional states, personality traits can be conceptualized as relatively enduring differences among people in specifiable tendencies to perceive the world in a certain way and in dispositions to react or behave in a specified manner with predictable regularity.

Personality traits have the characteristics of a class constructs that Atkinson (1964) calls "motives" and that Campbell (1963) refers to as "acquired behavioral positions." Atkinson defines motives as dispositional tendencies acquired in childhood that are latent until the cues of a situation activate them. Acquired dispositional concepts, according to Campbell, involve residues of past experience that dispose an individual both to view the world in a particular way to manifest "object-consistent" response tendencies.

Trait anxiety (T-Anxiety) refers to relatively stable individual differences in anxiety-proneness, that is, to differences between people in the tendency to perceive stressful situation as dangerous or threatening and to respond to such situations with elevations in the intensity of their state anxiety (S-Anxiety) reactions. T-Anxiety may also reflect individual differences in the frequency and intensity with which anxiety states have been manifested in the past, and in the probability that S-Anxiety will be experienced in the future. The stronger the anxiety trait, the more probable that the individual will experience more intense elevations in S-Anxiety in a threatening situation.

State and trait anxiety are analogous in certain respects to kinetic and potential energy. S-Anxiety, like kinetic energy, refers to a palpable reaction or process taking place at a given time and level of intensity. T-Anxiety, like potential energy, refers to individual differences in reactions. Potential energy refers to differences in the amount of kinetic energy associated with a particular physical object, which may be released if triggered by an appropriate force. Trait Anxiety implies differences between people in the disposition to respond to stressful situations with varying amounts of S-Anxiety. But whether or not people who differ in T-Anxiety will show corresponding differences in S-Anxiety depends on the extent to which each of them perceives a specific situation as psychologically dangerous or threatening, and this is greatly influenced by each individual's past experience.

Persons, with high T-Anxiety exhibit S-Anxiety elevations more frequently than low T-Anxiety individuals because they tend to interpret a wider range of situations as dangerous or threatening. High T-Anxiety persons are also more likely to respond with greater increases in the intensity of S-Anxiety in situations that involve interpersonal relationships and threaten self-esteem. In such situations, S-Anxiety may vary in intensity and fluctuate over time as a function of the amount of stress that impinges upon the person; but the individual's perception of threat may have greater impact on the level of S-Anxiety than the real danger associated with the situation.

Circumstances in which failure is experienced or an individual's personal adequacy is evaluated (e.g., taking an intelligence test) are generally more threatening to persons with high T-Anxiety (Spence & Spence, 1966; Spielberger, 1962; Spielberger & Smith, 1966). However, persons high in T-Anxiety do not appear to respond to physical dangers — e.g., threat of electric shock (Hodges & Spielberger, 1966) or imminent surgery (Auerbach, 1973; Martinez-Urrutia, 1975; Spielberger, Auerbach, Wadsworth, Dunn & Taulbee, 1975) — differently from persons with low T-Anxiety.

I.b. Description and Applications of the STAI

The *State-Trait Anxiety Inventory* (STAI) has been used extensively in research and clinical practice. It comprises separate self-report scales for measuring state and trait anxiety. The S-Anxiety scale (STAI Form Y-1) consists of twenty statements that evaluate how respondents feel “*right now*, at this moment.” The T-Anxiety scale (STAI Form Y-2) consists of twenty statements that assess how people *generally* feel. The STAI-Y S-Anxiety and T-Anxiety scales are printed on opposite sides of a single-page test form.

Consistent with the definition of state anxiety given earlier, the essential qualities evaluated by the STAI S-Anxiety scale are feelings of apprehension, tension, nervousness, and worry. In addition to assessing how people feel “right now,” the STAI S-Anxiety scale may also be used to evaluate how they felt at a particular time in the recent past and how they anticipate they will feel either in a specific situation that is likely to be encountered in the future or in a variety of hypothetical situations. Scores on the S-Anxiety scale increase in response to physical danger and psychological stress and decrease as a result of relaxation training. The S-Anxiety scale has been found to be a sensitive indicator of changes in transitory anxiety experienced by clients and patients in counseling, psychotherapy, and behavior-modification programs. The scale has also been used extensively to assess the level of S-Anxiety induced by stressful experimental procedures and by unavoidable real-life stressors such as imminent surgery, dental treatment, job interviews, or important school tests.

The STAI T-Anxiety scale has been widely used in assessing clinical anxiety in medical, surgical, psychosomatic, and psychiatric patients. Psychoneurotic and depressed patients generally have high scores on this scale. The T-Anxiety scale is also used for screening high school and college students and military recruits for anxiety problems, and for evaluating the immediate and long-term outcome of psychotherapy, counseling, behavior modification, and drug-treatment programs. In clinical and experimental research, the STAI T-Anxiety scale has proven useful for identifying persons with high levels of neurotic anxiety and for selecting subjects for psychological experiments who differ in motivation or drive level.

Although the STAI was developed for use with high school and college students and adults, it has been useful with junior high school students. A children's form, the *State-Trait Anxiety Inventory for Children* (STAIC), measures anxiety in elementary school children and provides norms for fourth-, fifth-, and sixth-grade students (Spielberger, 1973). The STAIC has also been successfully employed to measure anxiety levels of children in grades 1-3 (Papay, et al., 1975; Sikes, 1978).

The STAI has been adapted in more than thirty languages for cross-cultural research and clinical practice (Spielberger & Diaz-Guerrero, 1976, 1983). The STAIC has been adapted in Dutch, German, Greek, Hebrew, Portuguese, Russian, Spanish, and Turkish. See Appendix D.

On the basis of insights gained over the past decade from extensive research with the STAI (Form X), a major revision of the scale was begun in 1979. There were three major reasons for undertaking this revision:

1. To develop a "purer" measure of anxiety that would provide a firmer basis for discriminating between feelings of anxiety and depression, and for the differential diagnosis of patients suffering from anxiety disorders and depressive reaction. Consistent with this goal, several items included in Form X that appeared to be more closely related to depression than anxiety (e.g., "I feel blue," "I feel like crying") were replaced.
2. To replace several items for which the psychometric properties were found to be relatively weak for younger, less-educated persons and individuals from lower socioeconomic status groups. For example, "I feel anxious" had very poor psychometric properties for a sample of tenth-grade high school students, many of whom interpreted "anxious" to mean "eager"; and "I feel 'high strung'" contained an idiom whose meaning had shifted over the past decade, possibly as a consequence of the expanded use of drugs by adolescents and young adults.

3. To improve the factor structure of the T-Anxiety scale by achieving a better balance between anxiety-present (e.g., "I feel nervous and restless") and anxiety absent (e.g., "I feel pleasant") items. In Form X there were 13 anxiety-present and only 7 anxiety-absent items.

In Form Y, 30 percent of the Form X items were replaced, resulting in improved psychometric properties for both S-Anxiety and T-Anxiety scales. The number of anxiety-present and anxiety-absent items for the Form Y is better balanced, and the factor structure is more consistent and replicable (see Appendix B). Further research will be required to demonstrate that replacing items that had obvious depressive content improved the power of the Form Y to discriminate between patients suffering from anxiety and depression.

The normative data reported in this *Manual* are based primarily on Form Y (Spielberger et al., 1980). Since Forms X and Y are highly correlated, and it was not practicable to repeat all of the previous reliability and validity studies, some tables based on research with Form X have been retained and are clearly labeled as such) in this edition.

More than 2,000 studies using the STAI have appeared in the research literature since the *STAI Test Manual* was published (Spielberger et al., 1970), including studies in medicine, dentistry, education, psychology, and other social sciences. An annotated bibliography of studies with the STAI was published in 1974 (Smith & Lay). Examples of current research are described in section IV of this *Manual*. The *State-Trait Anxiety Inventory: A Comprehensive Bibliography* (Spielberger, 1989, 2nd ed.), which lists over 3,300 studies and reviews, is now available from MIND GARDEN.

II. Administration, Scoring, and Norms

II.a. Administration

The STAI was designed to be self-administering and may be given either individually or to groups. The inventory has no time limits. College students generally require about six minutes to complete either the S-Anxiety or the T-Anxiety scale, and approximately ten minutes to complete both. Less educated or emotionally disturbed persons may require ten minutes to complete one of the scales and approximately twenty minutes to complete both. Repeated administrations of the S-Anxiety scale typically require five minutes or less.

Although many of the items have face validity as measures of “anxiety,” the examiner should not use this term in administering the inventory. Rather, the STAI and its subscales should be consistently referred to as the *Self-Evaluation Questionnaire*, the title printed on the test form.

Examiners should establish rapport with respondents before administering the STAI. Approximately half of the items inquire about negative characteristics, (e.g., feeling, “tense,” “frightened,” or “upset”), and some people are reluctant to admit having these characteristics because they regard them as signs of weakness. More over, persons who desire to look good in the eyes of the examiner may respond more positively to anxiety-absent items (e.g., “I feel calm”) than they actually feel. To deal with such test-taking attitudes in individual clinical applications, the examiner needs to establish a trusting relationship with clients or patients by sincerely communicating that their honest and candid responses will enable the therapist or agency to be more helpful and effective. Similarly, in research settings, subjects generally respond more objectively and accurately if they are informed that their responses will be kept confidential, and especially, if they are promised feedback about their test results. Clinical and research findings suggest that distorting effects of adverse test-taking attitudes are not a serious problem if sufficient care is taken to obtain the cooperation and trust of the respondent at the time the STAI is administered. However, in situation in which there are strong reasons to expect that respondents are motivated to “fake good,” e.g., in screening applicants for employment, the STAI should only be used as part of a test batter that includes validity measures such as the MMPI Lie Scale. For applicants with high Lie scores, it may be assumed that STAI T-Anxiety scores underestimate the subject's anxiety proneness.

Complete instructions for the S-Anxiety and the T-Anxiety scales are printed on the test form. Critical to the validity of the inventory is the examinees' clear understanding of the “state” instructions, which require them to report how they feel “right now ... at this moment,” and the “trait” instruction, which ask them to indicate how they “generally” feel. The examiner should emphasize that instructions are different for the two parts of the inventory and that examinees must read both sets of instructions carefully.

In administering the STAI to groups, it is usually helpful to have the examinees read the directions silently while the examiner reads them aloud, and to give examinees an opportunity to raise questions. If specific questions arise, the examiner should respond in a noncommittal manner. Responses such as "Just answer according to how you generally feel" or "Answer the way you feel right now" will usually suffice. Although most persons respond to all of the STAI items without being prompted, examinees who raise this question should be instructed not to omit any items. In research applications of the STAI, the experimenter may wish to emphasize that subjects should respond to all of the items.

Although the T-Anxiety scale should always be given with the instructions printed on the test form, instruction for the S-Anxiety scale may be modified to evaluate the intensity of S-Anxiety for any situation or time interval of interest to an experimenter or clinician. Most people have no difficulty responding to the S-Anxiety items according to how they felt in a specific situation or at a particular moment in item, provided the feelings were recently experienced and the person is motivated to cooperate with the examiner.

In clinical practice, clients may be instructed to report the feelings they experienced at the time they were tested or in a counseling or psychotherapy session. They may also be asked to report how they feel before and after progressive relaxation or biofeedback training, or while they visualized a specific stimulus during desensitization in behavior therapy. When the STAI is administered for research purposes, the experimenter may wish to alter instructions for the S-Anxiety scale in order to focus on a particular time period. Research participants may be instructed to respond, for example, according to how they felt while performing a just-completed experimental task; or, when the task is a long one, it may be useful to instruct them to respond according to how they felt early in the task or while working on the final portion of the task.

To assess changes in anxiety over time, it is recommended that the S-Anxiety scale be given on each occasion for which a measure is needed, using either the same or different instructions as to the desired time period. For example, research participants may be asked to report how they feel "now, at this moment," both before and after they complete the task. Or they may be instructed to report how they feel immediately before they begin and, after the task is completed, how they felt at the time they were working on it. Repeated administrations of personality tests either lead to greater reliability in differentiating among subjects (Howard & Diesenhau, 1965) or have no significant influence on test scores (Bendig & Bruder, 1962).

When it is necessary to obtain repeated measures of S-Anxiety and time is a crucial factor, a ten-item S-Anxiety subscale may be administered (Spielberger, 1979). This briefer subscale interferes less with performance on an experimental task while providing a reasonable valid measure of S-Anxiety. Very brief S-Anxiety scales, consisting of as few as four or five items, have been used successfully in research on computer-assisted learning (e.g., O'Neil et al., 1969), but these scales are no longer recommended because the findings obtained with them are often unstable.

If the standardization of Form Y, the S-Anxiety scale was always administered first, followed by the T-Anxiety scale. This order is recommended when both scales are given together. Since the S-Anxiety scale was designed to be sensitive to the conditions under which the test is administered, scores on this scale can be influenced by the emotional climate that may be created if the T-Anxiety scale is given first. In contrast, it has been demonstrated that the T-Anxiety scale is relatively impervious to the conditions under which it is given (e.g., Auerbach, 1973; Lamb, 1969; Spielberger et al., 1973).

In responding to the STAI S-Anxiety scale, examinees blacken the number on the standard test form to the right of each item-statement that best describes the *intensity* of their feelings: (1) not at all; (2) somewhat; (3) moderately so; (4) very much so. In responding to the T-Anxiety scale, examinees are instructed to indicate how they generally feel by rating the *frequency* of their feelings of anxiety on the following four-point scale: (1) almost never; (2) sometimes; (3) often; (4) almost always.

The STAI may also be given with multiple-choice answer sheets that permit machine scoring. When these are used, the standard instructions must be modified accordingly and special emphasis must be given to the difference in instruction for the two parts of the inventory. Most of the normative data reported in this *Manual* were obtained with General Purpose NCS Answer Sheets. The file created by an optical scanner can be read by analysis software such as spread sheets and statistical packages, to score the weighted responses.

II.b. Scoring

Each STAI item is given a weighted score of 1 to 4. A rating of 4 indicates the *presence* of a high level of anxiety for ten S-Anxiety items and eleven T-Anxiety items (e.g., “I feel frightened,” “I feel upset”). A high rating indicates the *absence* of anxiety for the remaining ten S-Anxiety items and nine T-Anxiety items (e.g., “I feel calm,” “I feel relaxed”). The scoring weights for the *anxiety-present* items are the same as the blackened numbers on the test form. The scoring weights for the *anxiety-absent* items are reversed, i.e., responses marked 1, 2, 3, or 4 are scored 4, 3, 2, or 1, respectively. The anxiety-absent items for which the scoring weights are reversed on the S-Anxiety and T-Anxiety scales are:

S-Anxiety: 1, 2, 5, 8, 10, 11, 15, 16, 19, 20

T-Anxiety: 21, 23, 26, 27, 30, 33, 34, 36, 39

To obtain scores for the S-Anxiety and T-Anxiety scales, simply add the weighted scores for the twenty items that make up each scale, taking into account the fact that the scores are reversed for the above items. Scores for both the S-Anxiety and the T-Anxiety scales can vary from a minimum of 20 to a maximum of 80.

The scoring key is used for scoring the scales by hand. Make certain the appropriate key for each scale is placed on the test form and add the response values printed on the key for twenty items. This is most conveniently done with a simple hand counter, but a calculator may also be used. Record the scores for each scale in the space provided on the test form.

Although most persons with a fourth- or fifth-grade reading ability respond to all of the STAI items without special instructions, some individuals fail to do so because they do not understand the instructions or the content of some of the items. For respondents who omit one or two items on either scale, the prorated full-scale score can be obtained by the following procedure: determine the mean weighted score for the scale items to which the individual responded; multiply this value by 20; and round the product to the next higher whole number. If three or more items are omitted, however, the validity of the scale must be questioned.

II.c. Norms for the STAI

In collecting the data for the normative samples, the S-Anxiety scale was always given first, followed by the T-Anxiety scale. Normative data for Form Y are available for working adults, college students, high school students, and military recruits. Norms based on Form X are also reported in the *Manual* for male neuropsychiatric patients, general medical and surgical patients, and young prisoners. While these norms are not based on representative or stratified samples, STAI scores reported by other investigators for samples drawn from similar populations are quite comparable.

The Form Y norms for working adults are based on a total of 1,838 employees of the Federal Aviation Administration (1,387 males; 451 females). Although most were white-collar workers, the sample was heterogeneous with regard to educational level and age. Employees' administrative responsibility ranged from clerical positions to high levels of supervisory management.

The normative sample of college students consisted of 855 students enrolled in introductory psychology courses at the University of South Florida. The inventory was administered either during regular class periods or in special group-testing sessions. The high school normative sample consisted 424 tenth-grade students tested during regular class periods. The norms for military recruits are based on two samples: 1,701 male Air Force recruits tested on the second or third day of basic training at Lackland Air Force Base, Texas and 263 Navy recruits (192 males; 71 females) tested on their fifth day of basic training at the Navy Recruit Training Command, Orlando, Florida.

The means, standard deviations, and alpha reliabilities of S-Anxiety and T-Anxiety scores for these samples are reported in Table 1. The mean T-Anxiety scores for working adults were somewhat lower than those for students and military recruits. Although the mean T-Anxiety scores did not differ between the sexes for working adults and high school students, the female college students and military recruits (a majority of whom had some college training) were slightly higher in T-Anxiety than their male counterparts.

Table 1
Means, Standard Deviations, and Alpha Coefficients for
Working Adults, Students, and Military Recruits

| | Working Adults | | College Students ¹ | | High School Students | | Military Recruits | |
|------------------|----------------|------------|-------------------------------|------------|----------------------|------------|-------------------|-----------|
| | M (1,387) | F (451) | M (324) | F (531) | M (202) | F (222) | M (1,893) | F (71) |
| S-Anxiety | | | | | | | | |
| Mean | 35.72 | 35.20 | 36.47 | 38.76 | 39.45 | 40.54 | 44.05 | 47.01 |
| SD | 10.40 | 10.61 | 10.02 | 11.95 | 9.74 | 12.86 | 12.18 | 14.42 |
| Alpha | .93 | .93 | .91 | .93 | .86 | .94 | .93 | .95 |
| T-Anxiety | | | | | | | | |
| Mean | 34.89 | 34.79 | 38.30 | 40.40 | 40.17 | 40.97 | 37.64 | 40.03 |
| SD | 9.19 | 9.22 | 9.18 | 10.15 | 10.53 | 10.63 | 9.51 | 9.90 |
| Alpha | .91 | .91 | .90 | .91 | .90 | .90 | .89 | .90 |

¹S-Anxiety means, standard deviations, and alpha coefficients are based on 296 males and 481 females.

The mean S-Anxiety scores for the working adults and students were either similar to or slightly lower than the T-Anxiety scores for these groups, which would be expected in the conditions under which these subjects were tested were relatively nonstressful (neutral). In contrast, the mean S-Anxiety scores for the military recruits were substantially higher than their T-Anxiety scores, as would be expected because these subjects were tested shortly after they began highly stressful training programs. In general, the mean S-Anxiety score for a group will be approximately equal to its mean T-Anxiety score when the S-Anxiety scale is given under neutral conditions. The S-Anxiety scores are higher when this scale is given under stressful conditions and lower when it is given under relaxed circumstances, whereas T-Anxiety scores are generally not influenced by stress.

To examine the relationship between age and S-Anxiety and T-Anxiety scores, the data for the normative sample of working adults were divided into three subgroups — ages 19-39, 40-49, and 50-69 — and subdivided by sex. The S-Anxiety and T-Anxiety means, standard deviations, and alpha coefficients for these groups are presented in Table 2. The mean anxiety scores of the males and females in the two younger groups were quite similar; the scores for the oldest group were somewhat lower than those of the two younger groups, and working females above the age of 50 scored lowest. Significant main effects of age for both anxiety measures indicated that working males and females over 50 tended to be lower in anxiety than their younger colleagues. The relationship between age and Form Y scores is further examined in Appendix A.

Table 2
Means, Standard Deviations, and Alpha Coefficients
for Working Adults in Three Age Groups

| | Ages 19-39 | | Ages 40-49 | | Ages 50-69 | |
|------------------|------------|------------|------------|------------|------------|------------|
| | M (446) | F (210) | M (559) | F (135) | M (382) | F (382) |
| S-Anxiety | | | | | | |
| Mean | 36.54 | 36.17 | 35.88 | 36.03 | 34.51 | 32.20 |
| SD | 10.22 | 10.96 | 10.52 | 11.07 | 10.34 | 8.67 |
| Alpha | .92 | .93 | .93 | .94 | .92 | .90 |
| T-Anxiety | | | | | | |
| Mean | 35.55 | 36.15 | 35.06 | 35.03 | 33.86 | 31.79 |
| SD | 9.76 | 9.53 | 8.88 | 9.31 | 8.86 | 7.78 |
| Alpha | .92 | .92 | .91 | .92 | .96 | .89 |

Table 3
Percentile Ranks for Normal Adults in Three Age Groups

| Raw Score | 19-39 | | | | 40-49 | | | | 50-69 | | | | Raw Score |
|-----------|-------|-------|---------|-------|-------|-------|---------|-------|-------|-------|---------|-------|-----------|
| | Males | | Females | | Males | | Females | | Males | | Females | | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | |
| 80 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 80 |
| 79 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 79 |
| 78 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 78 |
| 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 77 |
| 76 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 76 |
| 75 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 75 |
| 74 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 74 |
| 73 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 73 |
| 72 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 72 |
| 71 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 71 |
| 70 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 70 |
| 69 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 69 |
| 68 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 68 |
| 67 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 67 |
| 66 | 100 | 100 | 99 | 100 | 99 | 100 | 99 | 100 | 100 | 100 | 100 | 100 | 66 |
| 65 | 100 | 100 | 99 | 100 | 98 | 100 | 99 | 100 | 100 | 100 | 99 | 100 | 65 |
| 64 | 100 | 100 | 99 | 100 | 98 | 100 | 99 | 100 | 99 | 100 | 99 | 100 | 64 |
| 63 | 100 | 100 | 98 | 100 | 98 | 100 | 98 | 100 | 99 | 100 | 99 | 100 | 63 |
| 62 | 99 | 100 | 97 | 100 | 98 | 100 | 96 | 99 | 99 | 100 | 99 | 100 | 62 |
| 61 | 98 | 99 | 95 | 99 | 98 | 100 | 96 | 99 | 99 | 100 | 99 | 100 | 61 |
| 60 | 98 | 99 | 95 | 98 | 98 | 100 | 96 | 99 | 98 | 100 | 99 | 100 | 60 |
| 59 | 98 | 98 | 95 | 97 | 97 | 100 | 96 | 99 | 98 | 100 | 99 | 100 | 59 |
| 58 | 97 | 98 | 95 | 96 | 96 | 99 | 96 | 99 | 97 | 100 | 99 | 100 | 58 |
| 57 | 96 | 98 | 94 | 95 | 96 | 99 | 94 | 99 | 97 | 99 | 99 | 100 | 57 |
| 56 | 95 | 97 | 94 | 95 | 95 | 99 | 94 | 97 | 96 | 98 | 99 | 100 | 56 |
| 55 | 94 | 96 | 93 | 95 | 94 | 98 | 93 | 96 | 96 | 98 | 99 | 100 | 55 |
| 54 | 94 | 96 | 92 | 94 | 94 | 97 | 93 | 95 | 96 | 98 | 99 | 100 | 54 |
| 53 | 93 | 95 | 91 | 93 | 93 | 97 | 93 | 94 | 95 | 97 | 99 | 99 | 53 |
| 52 | 92 | 94 | 91 | 93 | 93 | 96 | 91 | 93 | 94 | 96 | 99 | 99 | 52 |
| 51 | 91 | 94 | 89 | 93 | 92 | 94 | 89 | 92 | 94 | 96 | 99 | 99 | 51 |

Continued

**Table 3
(continued)
Percentile Ranks for Normal Adults in Three Age Groups**

| Raw Score | 19-39 | | | | 40-49 | | | | 50-69 | | | | Raw Score |
|-----------|-------|-------|---------|-------|-------|-------|---------|-------|-------|-------|---------|-------|-----------|
| | Males | | Females | | Males | | Females | | Males | | Females | | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | |
| 50 | 90 | 92 | 89 | 92 | 90 | 93 | 87 | 92 | 92 | 94 | 99 | 98 | 50 |
| 49 | 88 | 90 | 87 | 92 | 89 | 92 | 87 | 92 | 91 | 94 | 97 | 97 | 49 |
| 48 | 86 | 88 | 85 | 90 | 88 | 90 | 87 | 90 | 89 | 93 | 97 | 97 | 48 |
| 47 | 85 | 87 | 84 | 89 | 87 | 89 | 85 | 89 | 87 | 92 | 93 | 97 | 47 |
| 46 | 82 | 85 | 82 | 86 | 85 | 87 | 82 | 87 | 85 | 91 | 93 | 97 | 46 |
| 45 | 80 | 83 | 81 | 86 | 83 | 86 | 81 | 87 | 84 | 90 | 93 | 96 | 45 |
| 44 | 78 | 81 | 79 | 83 | 81 | 84 | 78 | 84 | 83 | 88 | 93 | 95 | 44 |
| 43 | 76 | 78 | 77 | 80 | 78 | 82 | 75 | 82 | 81 | 86 | 90 | 93 | 43 |
| 42 | 73 | 76 | 76 | 76 | 76 | 81 | 74 | 80 | 79 | 84 | 87 | 92 | 42 |
| 41 | 70 | 74 | 73 | 72 | 72 | 78 | 72 | 78 | 76 | 81 | 85 | 88 | 41 |
| 40 | 66 | 71 | 71 | 69 | 70 | 76 | 67 | 78 | 74 | 77 | 82 | 84 | 40 |
| 39 | 64 | 69 | 71 | 66 | 67 | 73 | 67 | 74 | 72 | 74 | 80 | 83 | 39 |
| 38 | 61 | 66 | 68 | 65 | 64 | 68 | 67 | 70 | 69 | 71 | 76 | 81 | 38 |
| 37 | 58 | 63 | 62 | 61 | 62 | 65 | 64 | 65 | 66 | 68 | 74 | 76 | 37 |
| 36 | 55 | 59 | 59 | 59 | 58 | 62 | 58 | 63 | 64 | 63 | 72 | 73 | 36 |
| 35 | 50 | 57 | 56 | 54 | 56 | 60 | 55 | 57 | 60 | 61 | 69 | 69 | 35 |
| 34 | 46 | 52 | 52 | 50 | 53 | 54 | 53 | 53 | 55 | 59 | 66 | 66 | 34 |
| 33 | 44 | 48 | 48 | 47 | 48 | 49 | 50 | 50 | 52 | 55 | 61 | 59 | 33 |
| 32 | 39 | 43 | 44 | 42 | 43 | 44 | 49 | 45 | 48 | 49 | 59 | 56 | 32 |
| 31 | 36 | 38 | 41 | 35 | 39 | 39 | 43 | 44 | 45 | 45 | 51 | 51 | 31 |
| 30 | 31 | 33 | 40 | 29 | 35 | 34 | 39 | 37 | 40 | 39 | 47 | 44 | 30 |
| 29 | 28 | 30 | 34 | 25 | 27 | 28 | 33 | 33 | 36 | 36 | 37 | 39 | 29 |
| 28 | 25 | 27 | 30 | 22 | 24 | 24 | 24 | 27 | 33 | 31 | 35 | 34 | 28 |
| 27 | 19 | 24 | 21 | 18 | 22 | 21 | 22 | 22 | 28 | 27 | 32 | 31 | 27 |
| 26 | 16 | 21 | 17 | 16 | 19 | 18 | 19 | 17 | 26 | 24 | 31 | 30 | 26 |
| 25 | 14 | 15 | 13 | 12 | 16 | 14 | 16 | 14 | 21 | 19 | 28 | 27 | 25 |
| 24 | 12 | 12 | 10 | 9 | 14 | 11 | 16 | 11 | 18 | 15 | 24 | 23 | 24 |
| 23 | 9 | 11 | 9 | 7 | 12 | 8 | 13 | 7 | 16 | 11 | 22 | 19 | 23 |
| 22 | 8 | 7 | 6 | 3 | 9 | 5 | 8 | 5 | 11 | 8 | 12 | 14 | 22 |
| 21 | 6 | 4 | 3 | 3 | 6 | 3 | 5 | 2 | 9 | 6 | 8 | 8 | 21 |
| 20 | 4 | 3 | 2 | 0 | 5 | 1 | 3 | 0 | 6 | 3 | 5 | 7 | 20 |

Table 4
Standard Scores for Normal Adults in Three Age Groups

| Raw Score | 19-39 | | | | 40-49 | | | | 50-69 | | | | Raw Score |
|-----------|-------|-------|---------|-------|-------|-------|---------|-------|-------|-------|---------|-------|-----------|
| | Males | | Females | | Males | | Females | | Males | | Females | | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | |
| 80 | 93 | 96 | 90 | 96 | 92 | 101 | 90 | 98 | 94 | 102 | 105 | 112 | 80 |
| 79 | 92 | 95 | 89 | 95 | 91 | 99 | 89 | 97 | 93 | 101 | 104 | 111 | 79 |
| 78 | 91 | 93 | 88 | 94 | 90 | 98 | 88 | 96 | 92 | 100 | 102 | 109 | 78 |
| 77 | 90 | 92 | 87 | 93 | 89 | 97 | 87 | 95 | 91 | 99 | 101 | 108 | 77 |
| 76 | 89 | 91 | 86 | 92 | 88 | 96 | 86 | 94 | 90 | 97 | 100 | 107 | 76 |
| 75 | 88 | 90 | 85 | 91 | 87 | 95 | 85 | 93 | 89 | 96 | 99 | 106 | 75 |
| 74 | 87 | 89 | 84 | 90 | 86 | 94 | 84 | 92 | 88 | 95 | 98 | 104 | 74 |
| 73 | 86 | 88 | 84 | 89 | 85 | 93 | 84 | 91 | 87 | 94 | 97 | 103 | 73 |
| 72 | 85 | 87 | 83 | 88 | 84 | 92 | 83 | 90 | 86 | 93 | 96 | 102 | 72 |
| 71 | 84 | 86 | 82 | 87 | 83 | 90 | 82 | 89 | 85 | 92 | 95 | 100 | 71 |
| 70 | 83 | 85 | 81 | 86 | 82 | 89 | 81 | 88 | 84 | 91 | 94 | 99 | 70 |
| 69 | 82 | 84 | 80 | 84 | 81 | 88 | 80 | 87 | 83 | 90 | 92 | 98 | 69 |
| 68 | 81 | 83 | 79 | 83 | 81 | 87 | 79 | 85 | 82 | 88 | 91 | 97 | 68 |
| 67 | 80 | 82 | 78 | 82 | 80 | 86 | 78 | 84 | 81 | 87 | 90 | 95 | 67 |
| 66 | 79 | 81 | 77 | 81 | 79 | 85 | 77 | 83 | 80 | 86 | 89 | 94 | 66 |
| 65 | 78 | 80 | 76 | 80 | 78 | 84 | 76 | 82 | 80 | 85 | 88 | 93 | 65 |
| 64 | 77 | 79 | 75 | 79 | 77 | 83 | 75 | 81 | 79 | 84 | 86 | 91 | 64 |
| 63 | 76 | 78 | 74 | 78 | 76 | 81 | 74 | 80 | 78 | 83 | 85 | 90 | 63 |
| 62 | 75 | 77 | 74 | 77 | 75 | 80 | 74 | 79 | 77 | 82 | 84 | 89 | 62 |
| 61 | 74 | 76 | 73 | 76 | 74 | 79 | 73 | 78 | 76 | 81 | 83 | 88 | 61 |
| 60 | 73 | 75 | 72 | 75 | 73 | 78 | 72 | 77 | 75 | 80 | 82 | 86 | 60 |
| 59 | 72 | 74 | 71 | 74 | 72 | 77 | 71 | 76 | 74 | 78 | 81 | 85 | 59 |
| 58 | 71 | 73 | 70 | 73 | 71 | 76 | 70 | 75 | 73 | 77 | 80 | 84 | 58 |
| 57 | 70 | 72 | 69 | 72 | 70 | 75 | 69 | 74 | 72 | 76 | 78 | 82 | 57 |
| 56 | 69 | 71 | 68 | 71 | 69 | 74 | 68 | 73 | 71 | 75 | 77 | 81 | 56 |
| 55 | 68 | 70 | 67 | 70 | 68 | 72 | 67 | 71 | 70 | 74 | 76 | 80 | 55 |
| 54 | 67 | 69 | 66 | 69 | 67 | 71 | 66 | 70 | 69 | 73 | 75 | 79 | 54 |
| 53 | 66 | 68 | 65 | 68 | 66 | 70 | 65 | 69 | 68 | 72 | 74 | 77 | 53 |
| 52 | 65 | 67 | 64 | 67 | 65 | 69 | 64 | 68 | 67 | 70 | 73 | 76 | 52 |
| 51 | 64 | 66 | 64 | 66 | 64 | 68 | 64 | 67 | 66 | 69 | 72 | 75 | 51 |

Continued

**Table 4
(Continued)
Standard Scores for Normal Adults in Three Age Groups**

| Raw Score | 19-39 | | | | 40-49 | | | | 50-69 | | | | Raw Score |
|-----------|-------|-------|---------|-------|-------|-------|---------|-------|-------|-------|---------|-------|-----------|
| | Males | | Females | | Males | | Females | | Males | | Females | | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | |
| 50 | 63 | 65 | 63 | 65 | 63 | 67 | 63 | 66 | 65 | 68 | 71 | 73 | 50 |
| 49 | 62 | 64 | 62 | 63 | 62 | 66 | 62 | 65 | 64 | 67 | 69 | 72 | 49 |
| 48 | 61 | 63 | 61 | 62 | 62 | 65 | 61 | 64 | 63 | 66 | 68 | 71 | 48 |
| 47 | 60 | 62 | 60 | 61 | 61 | 63 | 60 | 63 | 62 | 65 | 67 | 70 | 47 |
| 46 | 59 | 61 | 59 | 60 | 60 | 62 | 59 | 62 | 61 | 64 | 66 | 68 | 46 |
| 45 | 58 | 60 | 58 | 59 | 59 | 61 | 58 | 61 | 60 | 63 | 65 | 67 | 45 |
| 44 | 57 | 59 | 57 | 58 | 58 | 60 | 57 | 60 | 59 | 61 | 63 | 66 | 44 |
| 43 | 56 | 58 | 56 | 57 | 57 | 59 | 56 | 59 | 58 | 60 | 62 | 64 | 43 |
| 42 | 55 | 57 | 55 | 56 | 56 | 58 | 55 | 57 | 57 | 59 | 61 | 63 | 42 |
| 41 | 54 | 56 | 54 | 55 | 55 | 57 | 55 | 56 | 56 | 58 | 60 | 62 | 41 |
| 40 | 53 | 55 | 53 | 54 | 54 | 56 | 54 | 55 | 55 | 57 | 59 | 61 | 40 |
| 39 | 52 | 54 | 53 | 53 | 53 | 54 | 53 | 54 | 54 | 56 | 58 | 59 | 39 |
| 38 | 51 | 53 | 52 | 52 | 52 | 53 | 52 | 53 | 53 | 55 | 57 | 58 | 38 |
| 37 | 50 | 51 | 51 | 51 | 51 | 52 | 51 | 52 | 52 | 54 | 55 | 57 | 37 |
| 36 | 49 | 50 | 50 | 50 | 50 | 51 | 50 | 51 | 51 | 52 | 54 | 55 | 36 |
| 35 | 48 | 49 | 49 | 49 | 49 | 50 | 49 | 50 | 51 | 51 | 53 | 54 | 35 |
| 34 | 48 | 48 | 48 | 48 | 48 | 49 | 48 | 49 | 50 | 50 | 52 | 53 | 34 |
| 33 | 47 | 47 | 47 | 47 | 47 | 48 | 47 | 48 | 49 | 49 | 51 | 52 | 33 |
| 32 | 46 | 46 | 46 | 46 | 46 | 47 | 46 | 47 | 48 | 48 | 50 | 50 | 32 |
| 31 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 46 | 47 | 47 | 49 | 49 | 31 |
| 30 | 44 | 44 | 44 | 44 | 44 | 44 | 45 | 45 | 46 | 46 | 47 | 48 | 30 |
| 29 | 43 | 43 | 43 | 42 | 43 | 43 | 44 | 44 | 45 | 45 | 46 | 46 | 29 |
| 28 | 42 | 42 | 43 | 41 | 43 | 42 | 43 | 42 | 44 | 43 | 45 | 45 | 28 |
| 27 | 41 | 41 | 42 | 40 | 42 | 41 | 42 | 41 | 43 | 42 | 44 | 44 | 27 |
| 26 | 40 | 40 | 41 | 39 | 41 | 40 | 41 | 40 | 42 | 41 | 43 | 42 | 26 |
| 25 | 39 | 39 | 40 | 38 | 40 | 39 | 40 | 39 | 41 | 40 | 42 | 41 | 25 |
| 24 | 38 | 38 | 39 | 37 | 39 | 38 | 39 | 38 | 40 | 39 | 40 | 40 | 24 |
| 23 | 37 | 37 | 38 | 36 | 38 | 36 | 38 | 37 | 39 | 38 | 39 | 39 | 23 |
| 22 | 36 | 36 | 37 | 35 | 37 | 35 | 37 | 36 | 38 | 37 | 38 | 37 | 22 |
| 21 | 35 | 35 | 36 | 34 | 36 | 34 | 36 | 35 | 37 | 35 | 37 | 36 | 21 |
| 20 | 34 | 34 | 35 | 33 | 35 | 33 | 36 | 34 | 36 | 34 | 36 | 35 | 20 |

Table 5

Percentile Ranks for Students and Military Recruits

| Raw Score | College Students | | | | High School Students | | | | Military Recruits ¹ | |
|--------------|------------------|-------|---------|-------|----------------------|-------|---------|-------|--------------------------------|-------|
| | Males | | Females | | Males | | Females | | Males | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait |
| 78-80 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 |
| 76 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 |
| 75 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 |
| 74 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 99 | 100 |
| 73 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 99 | 100 |
| 72 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 100 | 98 | 100 |
| 71 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 98 | 100 |
| 70 | 100 | 100 | 99 | 99 | 100 | 99 | 98 | 99 | 97 | 100 |
| 69 | 100 | 100 | 99 | 99 | 100 | 99 | 97 | 99 | 97 | 100 |
| 68 | 100 | 100 | 99 | 99 | 100 | 99 | 97 | 98 | 97 | 100 |
| 67 | 100 | 100 | 99 | 99 | 100 | 98 | 97 | 98 | 96 | 100 |
| 66 | 100 | 99 | 99 | 99 | 99 | 98 | 96 | 98 | 95 | 99 |
| 65 | 99 | 99 | 98 | 98 | 99 | 98 | 96 | 98 | 95 | 99 |
| 64 | 99 | 99 | 97 | 98 | 99 | 98 | 94 | 98 | 94 | 99 |
| 63 | 98 | 99 | 96 | 97 | 99 | 98 | 94 | 97 | 93 | 99 |
| 62 | 98 | 99 | 95 | 97 | 99 | 98 | 93 | 97 | 92 | 99 |
| 61 | 98 | 99 | 94 | 96 | 99 | 98 | 93 | 97 | 91 | 98 |
| 60 | 97 | 99 | 94 | 96 | 98 | 97 | 92 | 96 | 90 | 98 |
| 59 | 97 | 99 | 93 | 95 | 98 | 97 | 92 | 95 | 89 | 97 |
| 58 | 97 | 99 | 92 | 94 | 98 | 97 | 90 | 94 | 87 | 97 |
| 57 | 97 | 97 | 91 | 93 | 97 | 96 | 89 | 93 | 86 | 97 |
| 56 | 96 | 97 | 90 | 92 | 96 | 95 | 88 | 92 | 84 | 96 |
| 55 | 95 | 96 | 89 | 91 | 95 | 94 | 87 | 91 | 82 | 96 |
| 54 | 94 | 95 | 88 | 90 | 94 | 92 | 86 | 90 | 81 | 95 |
| 53 | 93 | 93 | 86 | 89 | 93 | 90 | 86 | 88 | 79 | 94 |
| 52 | 92 | 92 | 85 | 87 | 92 | 88 | 84 | 85 | 77 | 93 |
| 51 | 92 | 90 | 84 | 86 | 92 | 87 | 82 | 83 | 75 | 92 |
| 50 | 90 | 88 | 82 | 85 | 88 | 85 | 80 | 80 | 72 | 90 |
| 49 | 88 | 87 | 80 | 83 | 85 | 81 | 78 | 78 | 69 | 89 |

¹Males only.

Continued

**Table 5
(Continued)
Percentile Ranks for Students and Military Recruits**

| Raw Score | College Students | | | | High School Students | | | | Military Recruits ¹ | |
|-----------|------------------|-------|---------|-------|----------------------|-------|---------|-------|--------------------------------|-------|
| | Males | | Females | | Males | | Females | | Males | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait |
| 48 | 86 | 85 | 79 | 81 | 81 | 78 | 76 | 76 | 67 | 87 |
| 47 | 84 | 82 | 78 | 79 | 80 | 75 | 73 | 74 | 64 | 85 |
| 46 | 83 | 81 | 75 | 76 | 76 | 71 | 72 | 72 | 61 | 83 |
| 45 | 81 | 79 | 73 | 72 | 73 | 68 | 68 | 69 | 58 | 80 |
| 44 | 80 | 76 | 71 | 69 | 68 | 65 | 64 | 65 | 55 | 78 |
| 43 | 78 | 74 | 69 | 66 | 64 | 63 | 60 | 61 | 51 | 75 |
| 42 | 75 | 71 | 68 | 62 | 61 | 60 | 58 | 59 | 48 | 72 |
| 41 | 72 | 67 | 66 | 59 | 59 | 56 | 55 | 57 | 44 | 69 |
| 40 | 70 | 60 | 63 | 53 | 56 | 53 | 51 | 53 | 41 | 66 |
| 39 | 68 | 57 | 58 | 50 | 54 | 47 | 49 | 48 | 38 | 63 |
| 38 | 64 | 54 | 55 | 46 | 48 | 45 | 45 | 44 | 35 | 59 |
| 37 | 62 | 52 | 52 | 42 | 44 | 43 | 44 | 40 | 32 | 55 |
| 36 | 58 | 49 | 47 | 40 | 41 | 41 | 41 | 36 | 28 | 51 |
| 35 | 53 | 44 | 45 | 36 | 38 | 36 | 39 | 33 | 26 | 46 |
| 34 | 49 | 38 | 42 | 32 | 32 | 34 | 37 | 31 | 23 | 41 |
| 33 | 46 | 35 | 39 | 29 | 30 | 30 | 35 | 27 | 21 | 38 |
| 32 | 42 | 33 | 35 | 25 | 26 | 25 | 33 | 23 | 18 | 34 |
| 31 | 36 | 28 | 31 | 21 | 21 | 22 | 29 | 20 | 16 | 29 |
| 30 | 30 | 22 | 28 | 17 | 18 | 19 | 27 | 18 | 14 | 25 |
| 29 | 25 | 16 | 24 | 14 | 15 | 16 | 23 | 15 | 11 | 21 |
| 28 | 22 | 12 | 20 | 10 | 13 | 14 | 20 | 10 | 10 | 16 |
| 27 | 19 | 10 | 17 | 8 | 12 | 11 | 18 | 9 | 8 | 12 |
| 26 | 17 | 8 | 15 | 5 | 10 | 9 | 16 | 7 | 7 | 10 |
| 25 | 12 | 6 | 12 | 3 | 8 | 7 | 12 | 6 | 5 | 8 |
| 24 | 9 | 3 | 10 | 2 | 7 | 6 | 9 | 5 | 4 | 5 |
| 23 | 6 | 3 | 8 | 1 | 5 | 4 | 6 | 3 | 3 | 4 |
| 22 | 4 | 1 | 6 | 0 | 3 | 3 | 4 | 2 | 2 | 2 |
| 21 | 2 | 1 | 4 | 0 | 2 | 2 | 4 | 1 | 1 | 1 |
| 20 | 2 | 0 | 3 | 0 | 2 | 2 | 2 | 0 | 1 | 1 |

¹Males only.

Table 6
Standard Scores for Students and Military Recruits

| Raw Score | College Students | | | | High School Students | | | | Military Recruits ¹ | |
|-----------|------------------|-------|---------|-------|----------------------|-------|---------|-------|--------------------------------|-------|
| | Males | | Females | | Males | | Females | | Males | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait |
| 80 | 93 | 95 | 85 | 89 | 92 | 88 | 81 | 87 | 80 | 95 |
| 79 | 92 | 94 | 84 | 88 | 91 | 87 | 80 | 86 | 79 | 94 |
| 78 | 91 | 93 | 83 | 87 | 90 | 86 | 79 | 85 | 78 | 92 |
| 77 | 90 | 92 | 82 | 86 | 89 | 85 | 78 | 84 | 77 | 91 |
| 76 | 89 | 91 | 81 | 85 | 88 | 84 | 78 | 83 | 76 | 90 |
| 75 | 88 | 90 | 80 | 84 | 86 | 83 | 77 | 82 | 75 | 89 |
| 74 | 87 | 89 | 79 | 83 | 85 | 82 | 76 | 81 | 75 | 88 |
| 73 | 86 | 88 | 79 | 82 | 84 | 81 | 75 | 80 | 74 | 87 |
| 72 | 85 | 87 | 78 | 81 | 83 | 80 | 74 | 79 | 73 | 86 |
| 71 | 84 | 86 | 77 | 80 | 82 | 79 | 74 | 78 | 72 | 85 |
| 70 | 83 | 85 | 76 | 79 | 81 | 78 | 73 | 77 | 71 | 84 |
| 69 | 82 | 83 | 75 | 78 | 80 | 77 | 72 | 76 | 70 | 83 |
| 68 | 81 | 82 | 74 | 77 | 79 | 76 | 71 | 75 | 70 | 82 |
| 67 | 80 | 81 | 74 | 76 | 78 | 75 | 71 | 74 | 69 | 81 |
| 66 | 79 | 80 | 73 | 75 | 77 | 75 | 70 | 74 | 68 | 80 |
| 65 | 78 | 79 | 72 | 74 | 76 | 74 | 69 | 73 | 67 | 79 |
| 64 | 77 | 78 | 71 | 73 | 75 | 73 | 68 | 72 | 66 | 78 |
| 63 | 76 | 77 | 70 | 72 | 74 | 72 | 67 | 71 | 66 | 77 |
| 62 | 75 | 76 | 69 | 71 | 73 | 71 | 67 | 70 | 65 | 76 |
| 61 | 74 | 75 | 69 | 70 | 72 | 70 | 66 | 69 | 64 | 75 |
| 60 | 73 | 74 | 68 | 69 | 70 | 69 | 65 | 68 | 63 | 74 |
| 59 | 72 | 73 | 67 | 68 | 70 | 68 | 64 | 67 | 62 | 73 |
| 58 | 71 | 71 | 66 | 67 | 69 | 67 | 64 | 66 | 62 | 71 |
| 57 | 70 | 70 | 65 | 66 | 68 | 66 | 63 | 65 | 61 | 70 |
| 56 | 69 | 69 | 64 | 65 | 67 | 65 | 62 | 64 | 60 | 69 |
| 55 | 68 | 68 | 64 | 64 | 66 | 64 | 61 | 63 | 59 | 68 |
| 54 | 67 | 67 | 63 | 63 | 65 | 63 | 60 | 62 | 58 | 67 |
| 53 | 66 | 66 | 62 | 62 | 64 | 62 | 60 | 61 | 57 | 66 |
| 52 | 65 | 65 | 61 | 61 | 63 | 61 | 59 | 60 | 57 | 65 |
| 51 | 65 | 64 | 60 | 60 | 62 | 60 | 58 | 59 | 56 | 64 |

¹Males only.

Continued

**Table 6
(continued)
Standard Scores for Students and Military Recruits**

| Raw Score | College Students | | | | High School Students | | | | Military Recruits ¹ | |
|-----------|------------------|-------|---------|-------|----------------------|-------|---------|-------|--------------------------------|-------|
| | Males | | Females | | Males | | Females | | Males | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait |
| 50 | 64 | 63 | 59 | 59 | 61 | 59 | 57 | 59 | 55 | 63 |
| 49 | 63 | 62 | 59 | 58 | 60 | 58 | 57 | 58 | 54 | 62 |
| 48 | 62 | 61 | 58 | 57 | 59 | 57 | 56 | 57 | 53 | 61 |
| 47 | 61 | 59 | 57 | 57 | 58 | 56 | 55 | 56 | 52 | 60 |
| 46 | 60 | 58 | 56 | 56 | 57 | 56 | 54 | 55 | 52 | 59 |
| 45 | 59 | 57 | 55 | 55 | 56 | 55 | 53 | 54 | 51 | 58 |
| 44 | 58 | 56 | 54 | 54 | 55 | 54 | 53 | 53 | 50 | 57 |
| 43 | 57 | 55 | 54 | 53 | 54 | 53 | 52 | 52 | 49 | 56 |
| 42 | 56 | 54 | 53 | 52 | 53 | 52 | 51 | 51 | 48 | 55 |
| 41 | 55 | 53 | 52 | 51 | 52 | 51 | 50 | 50 | 48 | 54 |
| 40 | 54 | 52 | 51 | 50 | 51 | 50 | 50 | 49 | 47 | 53 |
| 39 | 53 | 51 | 50 | 49 | 50 | 49 | 49 | 48 | 46 | 51 |
| 38 | 52 | 50 | 49 | 48 | 49 | 48 | 48 | 47 | 45 | 50 |
| 37 | 51 | 49 | 49 | 47 | 47 | 47 | 47 | 46 | 44 | 49 |
| 36 | 50 | 47 | 48 | 46 | 46 | 46 | 46 | 45 | 44 | 48 |
| 35 | 49 | 46 | 47 | 45 | 45 | 45 | 45 | 44 | 43 | 47 |
| 34 | 48 | 45 | 46 | 44 | 44 | 44 | 45 | 43 | 42 | 46 |
| 33 | 47 | 44 | 45 | 43 | 43 | 43 | 44 | 43 | 41 | 45 |
| 32 | 46 | 43 | 44 | 42 | 42 | 42 | 43 | 42 | 40 | 44 |
| 31 | 45 | 42 | 44 | 41 | 41 | 41 | 43 | 41 | 39 | 43 |
| 30 | 44 | 41 | 43 | 40 | 40 | 40 | 42 | 40 | 39 | 42 |
| 29 | 43 | 40 | 42 | 39 | 39 | 39 | 41 | 39 | 38 | 41 |
| 28 | 42 | 39 | 41 | 38 | 38 | 38 | 40 | 38 | 37 | 40 |
| 27 | 41 | 38 | 40 | 37 | 37 | 37 | 39 | 37 | 36 | 39 |
| 26 | 40 | 37 | 39 | 36 | 36 | 37 | 39 | 36 | 35 | 38 |
| 25 | 39 | 36 | 38 | 35 | 35 | 36 | 38 | 35 | 34 | 37 |
| 24 | 38 | 34 | 38 | 34 | 34 | 35 | 37 | 34 | 34 | 36 |
| 23 | 37 | 33 | 37 | 33 | 33 | 34 | 36 | 33 | 33 | 35 |
| 22 | 36 | 32 | 36 | 32 | 32 | 33 | 36 | 32 | 32 | 34 |
| 21 | 35 | 31 | 35 | 31 | 31 | 32 | 35 | 31 | 31 | 33 |
| 20 | 34 | 30 | 34 | 30 | 30 | 31 | 34 | 30 | 30 | 32 |

¹Males only.

Table 3 and 4 present the percentile ranks and T-scores, respectively, for the male and female working adults in the three age groups. Tables 5 and 6 present percentiles and T-scores for male and female college and high school students and male military recruits. Although 30 percent of the S-Anxiety and T-Anxiety items were replaced in the construction of Form Y (see section III.a. Test Construction and Development, and Appendix A), the mean S-Anxiety and T-Anxiety scores for Form Y for the normative samples of high school and college students were similar to the comparable means for Form X (Spielberger et. al., 1970 p.8, Table 3). To examine the correlation between Forms X and Y, the two scales were administered to small samples of high school and college students. The resulting correlations, reported in Table 7, were uniformly high, ranging from .96 to .98. Thus, although form Y has superior psychometric properties, research based on Form X can be readily generalized to Form Y. For most clinical and research applications, the two forms may be considered essentially equivalent for the assessment of anxiety. In differentiating between anxiety and depression, however, Form Y should be used (See section IV. Research with the STAI).

Table 7

Correlations between Form X and Form Y of the STAI for Students

| | N | S-Anxiety | T-Anxiety |
|--------------------|----------|------------------|------------------|
| College | | | |
| Males | 97 | .97 | .98 |
| Females | 96 | .96 | .96 |
| High School | | | |
| Males | 202 | .96 | .96 |
| Females | 222 | .97 | .97 |

Additional normative data for Form X are available for several populations of interest: neuropsychiatric (NP) patients, general medical and surgical (GMS) patients, and young prison inmates. Form X was administered to male NP and GMS patients, either individually or in small groups, at the following Veterans Administration Hospitals: Augusta, Georgia; Bay Pines and Miami, Florida; Biloxi and Gulfport, Mississippi; Charleston, South Carolina; Clarksburg, West Virginia; and Tuscaloosa, Alabama. The mean ages for the NP and GMS patients were 43 and 55, respectively; the mean educational level was tenth grade for both groups. Age and educational level were uncorrelated with STAI scores for the NP patients, but there was a significant negative correlation ($r = -.22$) between T-Anxiety scores and educational level for GMS patients. A similar trend between T-Anxiety scores and educational level for Form Y may be noted in Table 1: high school males also had higher T-Anxiety scores than college males in the normative samples for Form X (Spielberger et al., 1970).

The means and standard deviations for Form X S-Anxiety and T-Anxiety scores of the patients are reported in Table 8; percentile ranks and normalized T-scores for these groups are reported in Table 9. Diagnostic information was available for approximately two-thirds of the NP sample; slightly more than 30 percent of these patients were diagnosed as schizophrenic, and approximately 15 percent were diagnosed as neurotic. In the GMS sample, secondary diagnoses indicated that the medical or surgical condition of 20 percent of the patients was complicated by psychiatric factors. Table 8 reports the means and standard deviations for the subgroups of NP and GMS patients for whom differential diagnostic information was available.

Table 8
Means and Standard Deviations for Male Neuropsychiatric (NP) Patients, General Medical and Surgical (GMS) Patients, and Prison Inmates¹

| | N | <u>S-Anxiety</u> | | <u>T-Anxiety</u> | |
|--|------------|------------------|--------------|------------------|--------------|
| | | Mean | SD | Mean | SD |
| Total NP Patients | 461 | 47.74 | 13.24 | 46.62 | 12.41 |
| Depressive Reaction | 28 | 54.43 | 13.02 | 53.43 | 12.91 |
| Anxiety Reaction | 60 | 49.02 | 11.62 | 48.08 | 10.65 |
| Schizophrenia | 161 | 45.70 | 13.44 | 45.72 | 12.37 |
| Brain Damage | 31 | 46.94 | 13.41 | 44.64 | 11.20 |
| Character Disorder | 22 | 40.54 | 14.27 | 40.32 | 13.06 |
| Total GMS Patients | 161 | 42.38 | 13.79 | 41.91 | 12.70 |
| Patients with psychiatric complications | 34 | 42.35 | 15.66 | 44.62 | 14.12 |
| Patients without psychiatric complications | 110 | 42.68 | 13.76 | 41.33 | 12.55 |
| Prison Inmates | 212 | 45.96 | 11.04 | 44.64 | 10.47 |

¹Based on Form X.

Form X was administered to small groups of inmates at the Federal Correctional Institution, Tallahassee, Florida, as a part of the institution's classification and testing program. Normative data based on these inmates are also reported Table 8 and 9. The mean age of the prisoners was 21 years; their mean educational level was tenth grade. As in the GMS patient sample, there was a significant negative correlation ($r = -.25$) between T-Anxiety scores and level of educational achievement for the prison inmates.

Table 9
Percentile Ranks and Standard Scores for Male Neuropsychiatric (NP) Patients,
General Medical and Surgical (GMS) Patients, and Prison Inmates¹

| R/S | Percentiles | | | | | | Standard Scores | | | | | | R/S |
|-----|-------------|-------|--------------|-------|-----------|-------|-----------------|-------|--------------|-------|-----------|-------|-----|
| | NP Patients | | GMS Patients | | Prisoners | | NP Patients | | GMS Patients | | Prisoners | | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | |
| 80 | 100 | 100 | 100 | 100 | 100 | 100 | - | - | - | - | - | - | 80 |
| 79 | 100 | 100 | 100 | 100 | 100 | 100 | - | - | - | - | - | - | 79 |
| 78 | 100 | 100 | 100 | 100 | 100 | 100 | - | - | - | - | - | - | 78 |
| 77 | 100 | 100 | 100 | 100 | 100 | 100 | - | - | - | - | - | - | 77 |
| 76 | 100 | 100 | 100 | 100 | 100 | 100 | - | - | - | - | - | - | 76 |
| 75 | 99 | 100 | 98 | 100 | 100 | 100 | 72 | - | 71 | - | - | - | 75 |
| 74 | 98 | 100 | 98 | 100 | 100 | 100 | 70 | - | 70 | - | - | - | 74 |
| 73 | 97 | 99 | 97 | 100 | 100 | 100 | 69 | 72 | 69 | - | - | - | 73 |
| 72 | 96 | 98 | 97 | 99 | 99 | 100 | 68 | 71 | 68 | 74 | 72 | - | 72 |
| 71 | 95 | 98 | 96 | 98 | 98 | 100 | 67 | 70 | 68 | 72 | 71 | - | 71 |
| 70 | 95 | 97 | 96 | 97 | 98 | 100 | 66 | 69 | 68 | 70 | 71 | - | 70 |
| 69 | 93 | 97 | 96 | 97 | 98 | 100 | 65 | 68 | 68 | 68 | 70 | - | 69 |
| 68 | 92 | 95 | 96 | 96 | 97 | 100 | 64 | 67 | 67 | 67 | 69 | - | 68 |
| 67 | 90 | 95 | 95 | 95 | 96 | 99 | 63 | 66 | 66 | 66 | 67 | 72 | 67 |
| 66 | 89 | 94 | 94 | 95 | 95 | 98 | 62 | 65 | 66 | 66 | 66 | 70 | 66 |
| 65 | 88 | 92 | 93 | 94 | 94 | 97 | 62 | 64 | 65 | 66 | 66 | 69 | 65 |
| 64 | 86 | 90 | 92 | 94 | 94 | 96 | 61 | 63 | 64 | 66 | 66 | 68 | 64 |
| 63 | 86 | 89 | 92 | 94 | 94 | 96 | 61 | 62 | 64 | 66 | 65 | 67 | 63 |
| 62 | 84 | 88 | 92 | 94 | 93 | 95 | 60 | 62 | 64 | 66 | 65 | 67 | 62 |
| 61 | 83 | 86 | 91 | 94 | 92 | 94 | 60 | 61 | 63 | 66 | 64 | 66 | 61 |
| 60 | 82 | 85 | 89 | 94 | 91 | 93 | 59 | 60 | 62 | 66 | 63 | 65 | 60 |
| 59 | 81 | 83 | 87 | 94 | 88 | 92 | 59 | 60 | 61 | 65 | 62 | 64 | 59 |
| 58 | 80 | 81 | 86 | 92 | 85 | 90 | 58 | 59 | 61 | 64 | 61 | 63 | 58 |
| 57 | 77 | 79 | 85 | 92 | 83 | 89 | 58 | 58 | 60 | 64 | 59 | 62 | 57 |
| 56 | 75 | 77 | 84 | 91 | 81 | 87 | 57 | 57 | 60 | 63 | 59 | 62 | 56 |
| 55 | 73 | 75 | 83 | 89 | 79 | 86 | 56 | 57 | 59 | 62 | 58 | 61 | 55 |
| 54 | 70 | 72 | 82 | 87 | 76 | 84 | 55 | 56 | 59 | 61 | 57 | 60 | 54 |
| 53 | 66 | 70 | 82 | 85 | 75 | 79 | 54 | 55 | 59 | 60 | 57 | 58 | 53 |
| 52 | 63 | 67 | 80 | 82 | 71 | 74 | 53 | 55 | 59 | 59 | 56 | 57 | 52 |
| 51 | 60 | 64 | 78 | 79 | 68 | 71 | 53 | 54 | 58 | 58 | 55 | 56 | 51 |

¹Based on Form X.

Continued

Table 9 (continued)
Percentile Ranks and Standard Scores for Male Neuropsychiatric (NP) Patients,
General Medical and Surgical (GMS) Patients, and Prison Inmates¹

| R/S | Percentiles | | | | | | Standard Scores | | | | | | R/S |
|-----|-------------|-------|--------------|-------|-----------|-------|-----------------|-------|--------------|-------|-----------|-------|-----|
| | NP Patients | | GMS Patients | | Prisoners | | NP Patients | | GMS Patients | | Prisoners | | |
| | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | State | Trait | |
| 50 | 56 | 61 | 75 | 77 | 65 | 67 | 52 | 53 | 57 | 57 | 54 | 54 | 50 |
| 49 | 52 | 57 | 70 | 75 | 60 | 63 | 51 | 52 | 55 | 57 | 53 | 53 | 49 |
| 48 | 48 | 54 | 64 | 72 | 56 | 59 | 50 | 51 | 54 | 56 | 51 | 52 | 48 |
| 47 | 45 | 51 | 61 | 68 | 53 | 55 | 49 | 50 | 53 | 55 | 51 | 51 | 47 |
| 46 | 43 | 48 | 60 | 65 | 50 | 52 | 48 | 49 | 53 | 54 | 50 | 50 | 46 |
| 45 | 41 | 45 | 58 | 62 | 47 | 48 | 48 | 49 | 52 | 53 | 49 | 49 | 45 |
| 44 | 39 | 41 | 55 | 59 | 45 | 45 | 47 | 48 | 51 | 52 | 49 | 49 | 44 |
| 43 | 37 | 39 | 51 | 57 | 42 | 43 | 47 | 47 | 50 | 52 | 48 | 48 | 43 |
| 42 | 34 | 36 | 48 | 54 | 39 | 40 | 46 | 46 | 50 | 51 | 47 | 47 | 42 |
| 41 | 32 | 33 | 46 | 50 | 36 | 37 | 45 | 46 | 49 | 50 | 46 | 47 | 41 |
| 40 | 30 | 31 | 43 | 46 | 32 | 34 | 45 | 45 | 48 | 49 | 45 | 46 | 40 |
| 39 | 28 | 28 | 41 | 43 | 28 | 32 | 44 | 44 | 48 | 48 | 44 | 45 | 39 |
| 38 | 25 | 26 | 38 | 40 | 25 | 29 | 43 | 44 | 47 | 47 | 43 | 45 | 38 |
| 37 | 23 | 24 | 36 | 37 | 22 | 26 | 43 | 43 | 46 | 47 | 42 | 44 | 37 |
| 36 | 21 | 21 | 34 | 33 | 19 | 22 | 42 | 42 | 46 | 46 | 41 | 42 | 36 |
| 35 | 18 | 19 | 33 | 31 | 17 | 19 | 41 | 41 | 46 | 45 | 40 | 41 | 35 |
| 34 | 15 | 17 | 31 | 29 | 15 | 17 | 40 | 40 | 45 | 44 | 40 | 40 | 34 |
| 33 | 14 | 15 | 29 | 26 | 12 | 15 | 39 | 40 | 44 | 44 | 38 | 40 | 33 |
| 32 | 12 | 14 | 26 | 23 | 11 | 13 | 38 | 39 | 44 | 43 | 38 | 39 | 32 |
| 31 | 11 | 12 | 24 | 22 | 9 | 11 | 38 | 38 | 43 | 42 | 37 | 38 | 31 |
| 30 | 10 | 11 | 21 | 19 | 7 | 9 | 37 | 37 | 42 | 41 | 35 | 37 | 30 |
| 29 | 9 | 9 | 20 | 16 | 6 | 8 | 37 | 37 | 42 | 40 | 34 | 36 | 29 |
| 28 | 8 | 8 | 19 | 13 | 5 | 6 | 36 | 36 | 41 | 39 | 34 | 35 | 28 |
| 27 | 6 | 6 | 16 | 12 | 4 | 5 | 35 | 34 | 40 | 38 | 33 | 33 | 27 |
| 26 | 5 | 5 | 13 | 10 | 3 | 4 | 34 | 34 | 39 | 37 | 31 | 33 | 26 |
| 25 | 4 | 4 | 10 | 7 | 2 | 3 | 33 | 33 | 37 | 36 | 29 | 32 | 25 |
| 24 | 4 | 3 | 8 | 6 | 1 | 2 | 32 | 32 | 36 | 35 | 27 | 29 | 24 |
| 23 | 3 | 2 | 6 | 5 | 1 | 1 | 31 | 29 | 34 | 34 | 25 | 27 | 23 |
| 22 | 2 | 1 | 3 | 3 | - | - | 29 | 27 | 31 | 32 | - | - | 22 |
| 21 | 1 | 1 | 1 | 2 | - | - | 27 | 26 | 26 | 29 | - | - | 21 |
| 20 | 1 | - | - | 1 | - | - | - | 25 | 25 | - | - | - | 20 |

¹Based on Form X.

III. Development, Reliability, and Validity

III.a. Test Construction and Development

The construction of the STAI began in 1964 with the goal of developing a single set of items that could be administered with different instructions to provide objective measures of state and trait anxiety. Subsequent research findings changed our theoretical conception of anxiety and, especially, our assumptions about T-Anxiety. Test construction goals and procedures were therefore modified.

In compiling the initial item pool, items with a demonstrated relationship to other measures of anxiety were assumed to be most useful in constructing an inventory to measure both S-Anxiety and T-Anxiety. When test construction was begun, almost all anxiety scales measured trait anxiety (Spielberger, 1966). Therefore, items with content related to the most widely used T-Anxiety scales were rewritten to be used as a measure of both S-Anxiety and T-Anxiety. The result was a single scale, Form A, which could be administered with different instructions to measure either S-Anxiety or T-Anxiety.

In studying the validity of Form A, we discovered that the connotations of key words in some items interfered with the use of those items as measures of both S-Anxiety and T-Anxiety. Furthermore, some of the best items of both classes had been excluded because altering the instructions for these items could not overcome their strong state or trait connotations. For example, the item "I worry too much" seemed to connote a relatively stable personality trait, and this item correlated highly with other T-Anxiety items. Under stressful experimental conditions, however, scores for this item did not increase as would be expected of a measure of S-Anxiety, nor did they decrease as expected under relaxed conditions. Likewise, "I feel upset" was a highly sensitive S-Anxiety item but a relatively poor measure of T-Anxiety. Scores on this item varied as a function of situational stress when it was given with state instructions, but they were unstable when it was given with trait instructions.

On the basis of our item-validation attempts, we subsequently modified our test-construction strategy. For Form X, we selected items with the best psychometric properties for measuring either state or trait anxiety. Only five items met the validation criteria for both scales; three of these were retained verbatim, and two were rewritten but kept their original key terms. The remaining fifteen S-Anxiety and fifteen T-Anxiety items were sufficiently different in content or connotation to be regarded as unique to one type of anxiety measure and independent of the other.

More than 6,000 high school and college students, approximately 600 neuropsychiatric and medical surgical patients, and 200 prison inmates were tested in the development, standardization, and validation of Form X and earlier versions of the inventory. The early test construction and validation procedures, carried out primarily with under-

graduate college students at Vanderbilt University, were described in detail by Spielberger and Gorsuch (1966, pp. 45-68). The principal steps and procedures in the construction, standardization, and validation of Form X, which were described in the original *Test Manual* (Spielberger et al., 1970), are summarized in Appendix A of this *Manual*.

Over the past decade, the STAI has been used more extensively in psychological research than any other anxiety measure (Buros, 1978), and, in most applications, STAI scores have been interpreted as unidimensional measures of state and trait anxiety. The unidimensionality of the STAI scales has been questioned on the basis of several studies investigating the inventory's factor structure (e.g., Barker et al., 1977; Endler & Magnusson, 1976; Endler et al., 1976). However, distinctive state and trait anxiety factors were found in four studies that simultaneously factored all forty STAI items (Barker et al., 1977; Gaudry & Poole, 1975; Gaudry et al., 1975; Kendall et al., 1976), and individual S-Anxiety and T-Anxiety items consistently loaded on different factors in these studies. Anxiety-present and -absent factors were also found, suggesting that the anxiety-present and anxiety-absent items may be tapping different sources of variance (Spielberger et al., 1980).

In general, the factor structure for the Form X S-Anxiety scale, which had equal numbers of anxiety-present and anxiety-absent items, had been more stable and consistent than the structure of the T-Anxiety scale, which had thirteen anxiety-present items and only seven anxiety-absent items. The imbalance in the T-Anxiety scale apparently contributed to the instability of the results in studies of factor structure.

To examine the factor structure, Spielberger et al. (1980) administered the Form X with twelve potential replacement items (six S-Anxiety, six T-Anxiety) to a large sample of high school students. The content of the replacement items, which was consistent with theoretical refinements in our concept of anxiety (Spielberger, 1976; 1979; Spielberger et al., 1980), gave greater emphasis to the cognitive or "worry" aspects of anxiety than the original items. The potential replacement items also included several T-Anxiety items with anxiety-absent content in an effort to achieve a better balance between the anxiety-present and anxiety-absent items in this scale.

The factor analyses identified state and trait anxiety-absent and anxiety-present factors for both sexes. Several items contained key words, e.g., "I feel *anxious*," whose ambiguity for high school students was reflected in smaller factor loadings and item-remainder correlations. A rational analysis of item content also suggested that depression was more closely related than anxiety to several items in the original scale (e.g., "I am regretful"; "I feel like crying"; "I feel blue"). Other items seemed to reflect mania and elation (e.g., "I feel overexcited"; "I feel joyful") rather than merely the absence of anxiety.

In revising Form X, the weaker original items were replaced by items with equal or better psychometric properties and content that was more consistent with our concepts of state and trait anxiety; the items are shown in Table 10. The improved balance of anxiety-present and anxiety-absent items (from 13 and 7, respectively, in Form X to 11 and 9 in Form Y) reduced the influence of an acquiescence set. The procedure for selecting items for Form Y is described in detail by Spielberger et. al. (1980), and the anxiety-absent items are identified in the Scoring section of this *Manual*.

In the construction and standardization of Form Y, more than 5,000 subjects were tested. Studies of Form Y's factor structure have yielded clear-cut distinctions between state and trait anxiety. Also, almost identical anxiety-present and anxiety-absent factors were found for both sexes. Moreover, each factor was defined almost exclusively by S-Anxiety or T-Anxiety items. Research on Form Y's factor structure, described in detail by Spielberger et al. (1980) and Vagg et al. (1980), is summarized in Appendix B of this *Manual*.

Table 10
Form X Items Replace in Revising the Scale and the Replacement Items in Form Y

State-Anxiety Scale

| Original Items | Replacement Items |
|---|--------------------------|
| 4. I am regretful | 4. I feel strained |
| 8. I feel rested..... | 8. I feel satisfied |
| 9. I feel anxious | 9. I feel frightened |
| 14. I feel "high strung"..... | 14. I feel indecisive |
| 18. I feel over excited and "rattled" | 18. I feel confused |
| 19. I feel joyful | 19. I feel steady |

Trait-Anxiety Scale

| Original Items | Replacement Items |
|---|----------------------------------|
| 22. I tire quickly..... | 22. I feel nervous and restless |
| 23. I feel like crying..... | 23. I feel satisfied with myself |
| 25. I am losing out on things because I can't make up my mind soon enough..... | 25. I feel like a failure |
| 31. I am inclined to take things hard..... | 31. I have disturbing thoughts |
| 34. I try to avoid facing a crisis or difficulty | 34. I make decisions easily |
| 35. I feel blue..... | 35. I feel inadequate |

III.b. Reliability: Stability and Internal Consistency

Reliability data for Forms X and Y are presented in Table 11. The stability coefficients for Form Y were based on two groups of high school students tested in classroom settings. The stability coefficients for Form X are based on three different groups of undergraduate college students. The students retested after one hour were exposed to the following experimental conditions between test administrations: a brief period of relaxation training; a difficult IQ test; and a film depicting several accidents that resulted in serious injury. No special conditions were imposed on the other college groups, who were retested in classroom settings.

Table 11
Test-Retest Reliability for the STAI Scales

| High School Students | Test-Retest Interval | | | |
|----------------------|----------------------|-----|---------|-----|
| | 30 Days | | 60 Days | |
| | N | r | N | r |
| T-Anxiety | | | | |
| Males | 173 | .71 | 174 | .68 |
| Females | 178 | .75 | 201 | .65 |
| S-Anxiety | | | | |
| Males | 178 | .62 | 177 | .51 |
| Females | 179 | .34 | 205 | .36 |

| College Students ¹ | Test-Retest Interval | | | | | |
|-------------------------------|----------------------|-----|---------|-----|----------|-----|
| | 1 Hour | | 20 Days | | 104 Days | |
| | N | r | N | r | N | r |
| T-Anxiety | | | | | | |
| Males | 88 | .84 | 38 | .86 | 25 | .73 |
| Females | 109 | .76 | 75 | .76 | 22 | .77 |
| S-Anxiety | | | | | | |
| Males | 88 | .33 | 38 | .54 | 25 | .33 |
| Females | 109 | .16 | 75 | .27 | 22 | .31 |

¹Based on Form X.

The test-retest correlations for the T-Anxiety scale were reasonably high for the college students, ranging from .73 to .86 for the six subgroups, but somewhat lower for the high school students, ranging from .65 to .75. The median reliability coefficient for the T-Anxiety scale for college and high school students were .765 and .695, respectively. For the S-Anxiety scale, the stability coefficients for college and high school students were relatively low, ranging from .16 to .62, with a median reliability coefficient of only .33. Relatively low stability coefficients were expected for the S-Anxiety scale because a valid measure of state anxiety should reflect the influence of unique situational factors that exist at the time of testing.

Given the transitory nature of anxiety states, measures of internal consistency such as the alpha coefficient provide a more meaningful index of the reliability of S-Anxiety scales than test-retest correlations. Alpha coefficients for the Form Y S-Anxiety and T-Anxiety scales, computed by Formula KR-20 as modified by Cronbach (1951), are reported in Tables 1 and 2 for the normative samples. It can be noted in Table 1 that all but one of the S-Anxiety alphas were above .90 for the samples of working adults, students, and military recruits, with a median coefficient of .93. The alpha coefficients for the T-Anxiety scale were also uniformly high, with a median coefficient of .90. In addition, as may be noted in Table 2, the S-Anxiety and T-Anxiety alpha coefficients for the working adults remained high over the entire age range.

Alpha reliability coefficients are typically higher for the STAI S-Anxiety scale when it is given under conditions of psychological stress. For example, the alpha reliability of the Form X S-Anxiety scale was .92 when it was administered to a group of college males immediately after a difficult intelligence test, and .94 when it was given immediately after a distressing film. For the same subjects, the alpha reliability was .89 when it was given following a brief period of relaxation training. Additional information on the internal consistency for the S-Anxiety scale under varying degrees and kinds of stress are reported in the following section.

Further evidence of the internal consistency of the STAI scales is provided by item-remainder correlations computed for the normative samples. The median S-Anxiety item-remainder correlation was .63 for the working adults, .59 for the college students, .55 for the high school students, and .61 for the military recruits. The corresponding T-Anxiety item-remainder correlations were .56, .57, .54, and .52, respectively. The item-remainder correlations were .50 or higher for more than half of the items on both scales; all of the T-Anxiety items, and nineteen of the twenty S-Anxiety items, had item-remainder correlations of .30 or above in all of the normative samples for both sexes. These data are reported in Tables 25 and 26 of Appendix C.

The item-remainder correlation coefficients are higher for individual items when the S-Anxiety scales is given under stressful conditions. This is particularly true for items with the lowest item-remainder coefficients under relaxed circumstances. The median item-remainder correlation for the Form X S-Anxiety scale was .61 following a difficult intelligence test, .65 when it was given after a disturbing movie, but only .46 when administered after relaxation training. Item-remainder correlations for individual items for the S-Anxiety scale given under conditions with varying amounts of stress are reported in Table 27 of Appendix C.

In summary, stability, as measured by test-retest coefficients, is relatively high for the STAI T-Anxiety scale and low for the S-Anxiety scale, as would be expected for measure assessing changes in anxiety resulting from situational stress. The internal consistency for both the S-Anxiety and T-Anxiety scales are quite high as measured by alpha coefficients and item-remainder correlations. The internal consistency for Form Y is slightly higher than for Form X, which has resulted from replacement of the items in the earlier form with depressive content and weaker psychometric properties. The overall median alpha coefficients for the S-Anxiety and T-Anxiety scales for Form Y in the normative samples are .92 and .90, respectively, as compared to median alphas of .87 for S-Anxiety and .89 for T-Anxiety in the normative samples for Form X.

III.c. Validity

The STAI provides operational measures of state and trait anxiety as defined under “State and Trait Anxiety” in section I. Introduction. Individual STAI items were required to meet validity criteria at each stage of the test development process in order to be retained of further evaluation and validation. The test construction and validation process is described by Spielberger and Gorsuch (1966) and Spielberger et al. (1970), and in Appendices A, B, and C of this *Manual*. Representative findings with the STAI in selected areas of research are discussed section IV.

This section examines evidence of the concurrent, convergent, divergent, and construct validity of the STAI scales. It reports research findings relating to the following six areas: contrasted groups; correlations of the T-Anxiety scale with other measures of trait anxiety; correlations of the STAI scales with other widely used measures of personality and adjustment; correlations of the STAI scales with measures of academic aptitude and achievements; and investigations of the effects of different amounts and types of stress on S-Anxiety scores.

Contrasted Groups

Evidence of the construct validity of the T-Anxiety scale may be seen in comparing the mean scores of the various neuropsychiatric patient (NP) groups, reported in Table 8, with those of the normal subjects reported in Tables 1 and 2. All but one of the NP groups had substantially higher T-Anxiety scores than the normal subjects, providing evidence that the STAI discriminates between normals and psychiatric patients for whom anxiety is a major symptom. The lower T-Anxiety scores of the character disorder group, for whom the absence of anxiety is an important defining condition, provides further evidence of the construct validity of the STAI. Table 8 also reports that general medical and surgical (GMS) patients with psychiatric complications had higher T-Anxiety scores than GMS patient without complications, indicating that the scale identified nonpsychiatric patients with emotional problems.

Evidence of the construct validity of the S-Anxiety scale may be observed in Table 1, in which the scores of military recruits, tested shortly after they began highly stressful training programs, were much higher than those of college and high school students of about the same age who were tested under relatively nonstressful conditions. The mean S-Anxiety scores for the recruits were also much higher than their own T-Anxiety scores, suggesting that these subjects were experiencing a high state of emotional turmoil when they were tested. In contrast, the mean S-Anxiety and T-Anxiety scores for normal subjects tested under relatively nonstressful conditions were quite similar (See Table 1). Further evidence of the construct validity of the STAI S-Anxiety scale may be noted in the finding that the S-Anxiety scores of college students were significantly higher under examination conditions, and significantly lower after relaxation training, than when they were tested in a regular class period (see Tables 19 and 20).

Correlations between the S-Anxiety and T-Anxiety Scales

The correlations between the Form Y S-Anxiety and T-Anxiety scales for the normative samples working adults, students, and military recruits are reported in Table 12. The median correlation for these seven samples was .65. Persons high in T-Anxiety tend to be higher in S-Anxiety, even in relatively neutral situations. In general, Trait-State Anxiety Theory predicts higher correlations between S-Anxiety and T-Anxiety in social evaluative situations and lower correlations in physical-danger situation (Spielberger, 1966, 1972). Since the correlations between the scales seem to depend upon the amount and kind of stress associated with the conditions under which the S-Anxiety scale is administered, they have important implications of the construct validity of the STAI.

Table 12
Correlations between State and Trait Anxiety Scales for Working Adults, Students, and Military Recruits

| | Working Adults | College Students | High School Students | Military Recruits |
|----------------|----------------|------------------|----------------------|-------------------|
| Males | .75 | .65 | .72 | .59 |
| Females | .70 | .59 | .64 | — |

To determine the correlation between the S-Anxiety and T-Anxiety scales under stressful and nonstressful conditions, the Form X T-Anxiety scale was given at the beginning and at the end of a testing session in which college students were exposed to varying amounts and different kinds of experimental stress. The S-Anxiety scale was given on four occasions during the same testing session. The mean S-Anxiety scores increased under conditions of greater *a priori* stress and decreased under more relaxed conditions, whereas the T-Anxiety scores remained constant. For females, the correlations between the S-Anxiety and T-Anxiety scales varied between .11 and .53, with a median reliability coefficient of .30; the corresponding correlations for males varied between .37 and .67, with a median reliability coefficient of .47.

Correlations between the S-Anxiety and T-Anxiety scales are typically higher under conditions that pose some threat to self-esteem, or under circumstances in which personal adequacy is evaluated; and correlations are lower in situations characterized by physical danger. Moreover, changes in S-Anxiety evoked by threats of physical danger appear to be unrelated to level of T-Anxiety (Hodges, 1967; Hodges & Spielberger, 1966; Lamb, 1969). State-trait anxiety correlations tend to be slightly higher when the STAI scales are given in the same testing session, one immediately following the other, but such correlations are markedly lower if the subjects are exposed to or threatened with some form of physical danger.

Correlations of the T-Anxiety Scale with Other Trait Anxiety Measures

Evidence of the concurrent validity of the Form X T-Anxiety scales is presented in Table 13 in which correlations with the *IPAT Anxiety Scale* (Cattell & Scheier, 1963), the *Taylor Manifest Anxiety Scale* (TMAS; 1953), and the *Zuckerman Affect Adjective Checklist* (AACK; 1960), General Form, are reported for college students and neuropsychiatric patients. The IPAT Anxiety Scale and the TMAS were the most widely used measures of trait anxiety at the time Form X was being developed (Spielberger et al., 1970). Correlations between the T-Anxiety scale, the IPAT, and the TMAS were relatively high, ranging from .85 to .73. In contrast, the AACL, General Form, correlated only moderately with the other measures, suggesting that this scale is apparently less adequate as a measure of trait anxiety.

Since the correlations among the IPAT, the TMAS, and the T-Anxiety scale approached the reliabilities of these scales, the three inventories can be considered, essentially, as equivalent measures of trait anxiety. A major advantage of the T-Anxiety scale, however, is that it consists of only twenty items, as compared with the forty-three-item IPAT and the fifty-item TMAS, and thus requires only half as much time to administer as the other scales. Form Y also measures trait anxiety with high internal consistency and without items with depressive content or weak psychometric properties. The TMAS, by contrast, contains items that may reflect depression rather than anxiety (E.g., “I cry easily,” “I feel useless at times,” and “At times I think I am no good at all”). Similarly, several IPAT items appear more closely related to anger than anxiety (e.g., “Often I get angry with people too quickly”).

Table 13
Correlations between the Trait Anxiety Scale and Other Measures of Trait Anxiety¹

| Anxiety Scale | College Females (N= 126) | | | College Males (N= 80) | | | NP Patients (N= 66) | |
|---------------|-----------------------------|------|------|--------------------------|------|------|------------------------|------|
| | STAI | IPAT | TMAS | STAI | IPAT | TMAS | STAI | IPAT |
| IPAT | .75 | | | .76 | | | .77 ² | |
| TMAS | .80 | .85 | | .79 | .73 | | .83 | .84 |
| AACL | .52 | .57 | .53 | .58 | .51 | .41 | | |

¹Based on Form X.

²N = 112 for the correlation between the STAI and IPAT.

Correlations of the STAI with Other Personality Tests

Correlations of the STAI scales and other measures of personality provide evidence of the convergent and divergent validity of the STAI. In general, larger correlations would be expected with measures of emotional disturbance and psychopathology, and smaller correlations would be expected with unrelated constructs: In addition, differences in the correlations between the S-Anxiety and T-Anxiety scales for different samples also provide information about the extent to which the relationships among the measures reflect acute anxiety or anxiety-proneness.

Correlations of Form X scales with the *Minnesota Multiphasic Personality Inventory* (MMPI) are reported in Table 14 for hospitalized male neuropsychiatric patients from two Veterans Administration Hospitals. Although the correlations between the T-Anxiety scale and individual MMPI clinical scales were roughly comparable in the two samples, the S-Anxiety MMPI correlations were consistently in the two samples, the S-Anxiety-MMPI correlations were consistently higher for the Clarksburg patients than for the Gulfport patients. This finding may be attributable to the possibility that the

Clarksburg patients were more acutely disturbed, as indicated by their higher mean scores on all of the MMPI clinical scales. The Clarksburg patients were also substantially higher than the Gulfport patients on the Depression (D), Psychasthenia (Pt), and Schizophrenia (Sc) scales, for which elevations reflect high levels of acute anxiety (S-Anxiety). In contrast, the Gulfport sample consisted largely of chronic schizophrenic patients with long histories of hospitalization. Although the mean T-Anxiety scores for the Clarksburg and Gulfport samples were not significantly different, the mean S-Anxiety scores of 50.07 for the Clarksburg patients was significantly higher than the mean S-Anxiety score of 46.20 for the Gulfport patients ($p < .01$).

Table 14
Correlations of the STAI Scales with the *Minnesota Multiphasic Personality Inventory* for Two Samples of Hospitalized Neuropsychiatric Patients¹

| MMPI | Clarksburg Patients (N= 129) | | | | Gulfport Patients (N= 79) | | | |
|-----------------|---------------------------------|-------|--------------|-------|------------------------------|-------|--------------|-------|
| | Mean | SD | Correlations | | Mean | SD | Correlations | |
| | | | State | Trait | | | State | Trait |
| L | 4.43 | 2.90 | -.52 | -.49 | 4.75 | 2.51 | -.34 | -.25 |
| F | 10.90 | 7.14 | .56 | .60 | 10.06 | 8.44 | .34 | .61 |
| K | 11.77 | 5.65 | -.64 | -.63 | 13.76 | 5.33 | -.46 | -.60 |
| Hs | 16.32 | 7.44 | .57 | .60 | 14.30 | 7.91 | .40 | .49 |
| D | 30.44 | 7.07 | .57 | .57 | 27.68 | 6.87 | .44 | .61 |
| Hy | 28.71 | 6.90 | .26 | .26 | 27.34 | 6.72 | .23 | .21 |
| Pd | 22.90 | 5.55 | .52 | .49 | 21.48 | 6.08 | .48 | .60 |
| Mf | 24.44 | 4.75 | .20 | .28 | 23.15 | 4.52 | .16 | .25 |
| Pa | 13.24 | 5.11 | .50 | .53 | 12.26 | 5.18 | .24 | .50 |
| Pt | 23.52 | 10.97 | .79 | .81 | 17.92 | 11.25 | .45 | .65 |
| Sc | 24.01 | 13.60 | .71 | .75 | 19.53 | 14.67 | .46 | .68 |
| Ma | 19.38 | 5.36 | .30 | .31 | 18.57 | 5.23 | .33 | .48 |
| CORNELL: | | | | | | | | |
| | 33.74 | 19.46 | .70 | .70 | | | | |
| BETA: | | | | | | | | |
| | 96.37 | 9.48 | -.08 | -.03 | | | | |

¹Based on Form X.

Correlations between the STAI scales, the *Cornell Medical Index*, and the U.S. *Army Beta* intelligence test are also reported in Table 14 for the Clarksburg patients. That the Cornell Medical Index correlated .70 with both the T-Anxiety and S-Anxiety scales indicates that a large number of medical symptoms are associated with high STAI scores. The absence of a relationship between the STAI scales and the Beta test is

consistent with findings that the STAI is essentially unrelated to measures of intelligence or scholastic aptitude.

Form X and Jackson's (1967) *Personality Research Form* (PRF) were routinely administered to students seen at the Florida State University Counseling Center. Complete data were unavailable for a total of 162 undergraduates. Slightly more than 75 percent of these clients sought counseling for educational and vocational problems; the remainder, for emotional problems. Two-thirds of the clients were males. Approximately 40 percent were junior; the others were equally divided among freshmen, sophomores, and seniors. As reported in Table 15, the mean S-Anxiety and T-Anxiety scores of clients with emotional problems were significantly higher than those clients with educational-vocational problems.

Table 15 also reports correlations of the STAI scales with the various subscales of the PRF. Since the T-Anxiety scores reflect enduring personality dispositions, whereas the S-Anxiety scores refer to transitory conditions, correlations between the T-Anxiety scale and the PRF subscales are more important. For both groups of clients, significant positive correlations were obtained between the T-Anxiety scale and the PRF Aggression and Impulsivity scales, and there was a significant negative correlation with the PRF Endurance scale.

For clients with emotional problems, significant negative correlations were also found between the T-Anxiety scale and the PRF affiliation, Dominance, Nurturance, and Order scales. Although for clients with educational-vocational problems, no relationships were found between these scales and T-Anxiety, there was a significant positive correlation between the PRF Social Recognition scale and T-Anxiety. The correlations of the S-Anxiety scale with various PRF scales tended to be similar to but smaller than those obtained with the T-Anxiety scale.

Correlations of Form X scales with subscales of the *Edwards Personal Preference Schedule* (EPPS, 1954) are reported in Table 16 for forty-three undergraduate students tested during a regular class period. Only the EPPS Abasement scale was significantly correlated ($r = .42$) with the T-Anxiety scale. This same sample demonstrated a significant scale and the Hostility Scale of the *Multiple Affect Adjective Checklist* (MAACL) (Zuckerman & Lubin, 1965), which also correlated .47 and .42, respectively, with the S-Anxiety and T-Anxiety scales. Thus, the STAI scales were independent of the personality dimensions measured by the EPPS, except for Abasement. The positive correlation between the T-Anxiety scales and the EPPS Abasement scale was consistent with the finding that both of these scales were positively correlated with hostility, as measured by the MAACL.

Form X and the *Mooney Problem Checklist*, College Form (Mooney & Gordon, 1950) were administered to students during a regular class period of an introductory psychology course at Florida State University. The correlations between the STAI scales and the number of problems checked in each area sampled by the Mooney are reported in Table 17. The T-Anxiety scale correlated significantly with each problem area, while correlations between the S-Anxiety scale and the Mooney were lower in magnitude and many of these coefficients were not statistically significant.

Table 15

Correlations of the STAI Scales with Jackson's *Personality Research Form* for University Counseling Center Clients with Educational-Vocational or Emotional Problems¹

| PRF Scales | Clients with Educational-Vocational Problems (N = 124) | | | |
|---------------------------|--|------|-------------|-------------|
| | Mean | SD | Correlation | |
| | | | State | Trait |
| Achievement | 12.84 | 3.18 | -.10 | -.20 |
| Affiliation | 14.71 | 3.41 | .07 | -.06 |
| Aggression | 6.14 | 3.61 | .31* | .44* |
| Autonomy | 8.20 | 3.14 | -.06 | -.05 |
| Dominance | 9.93 | 4.18 | -.01 | -.07 |
| Endurance | 11.42 | 3.44 | -.13 | -.21 |
| Exhibition | 10.01 | 3.69 | .10 | .07 |
| Harm Avoidance | 7.68 | 3.77 | .02 | .02 |
| Impulsivity | 9.74 | 3.76 | .21 | .35* |
| Nurturance | 14.20 | 3.11 | .09 | .00 |
| Order | 10.68 | 4.18 | -.06 | -.14 |
| Play | 11.35 | 3.68 | .15 | .11 |
| Social Recognition | 11.17 | 4.47 | .28* | .38* |
| Understanding | 13.31 | 2.97 | .05 | .07 |
| Infrequency | .55 | 1.16 | .05 | .01 |
| <u>STAI Scales</u> | | | | |
| A-Trait | 40.03 | 9.22 | .61 | — |
| A-State | 36.68 | 8.49 | — | .61 |

Correlations **bolded** are significant at the .05 level; correlations followed by an asterisk are significant at the .01 level.

¹Based on Form X.

Continued

Table 15
(Continued)
Correlations of the STAI Scales with Jackson's *Personality Research Form*
for University Counseling Center Clients
with Educational-Vocational or Emotional Problems¹

| PRF Scales | Clients with Emotional Problems (N= 38) | | | |
|---------------------------|---|-------|-------------|--------------|
| | Mean | SD | Correlation | |
| | | | State | Trait |
| Achievement | 12.68 | 3.83 | -.10 | -.16 |
| Affiliation | 14.92 | 3.66 | -.17 | -.38 |
| Aggression | 5.34 | 3.40 | .28 | .34 |
| Autonomy | 8.05 | 3.00 | -.12 | .01 |
| Dominance | 8.71 | 4.31 | .14 | -.32 |
| Endurance | 10.53 | 3.65 | -.19 | -.34 |
| Exhibition | 9.42 | 4.64 | .17 | .20 |
| Harm Avoidance | 7.42 | 4.24 | -.19 | -.20 |
| Impulsivity | 10.60 | 4.30 | .24 | -.51* |
| Nurturance | 14.45 | 3.46 | -.27 | -.43* |
| Order | 10.08 | 4.96 | -.06 | -.42* |
| Play | 11.32 | 3.49 | -.02 | .02 |
| Social Recognition | 11.13 | 3.86 | .02 | .18 |
| Understanding | 14.00 | 2.73 | -.22 | -.22 |
| Infrequency | .47 | .73 | .08 | .19 |
| <u>STAI Scales</u> | | | | |
| A-Trait | 44.39 | 10.81 | — | .65 |
| A-State | 40.37 | 9.34 | .65 | — |

Correlations **bolded** are significant at the .05 level; correlations followed by an asterisk are significant at the .01 level.

¹Based on Form X.

Table 16
Correlations of the STAI Scales with THE *Edwards Personal Preference Schedule*
(N = 43)¹

| EPPS Scales | Mean | SD | Correlation | |
|---------------------------|-------|-------|-------------|--------------|
| | | | State | Trait |
| Abasement | 13.23 | 4.81 | .294 | .418* |
| Achievement | 15.60 | 3.83 | .062 | .185 |
| Affiliation | 14.42 | 4.70 | -.046 | -.202 |
| Aggression | 11.05 | 5.09 | .017 | .247 |
| Autonomy | 13.58 | 4.53 | -.093 | -.104 |
| Change | 17.56 | 4.77 | -.060 | -.103 |
| Consistency | 11.91 | 1.85 | -.286 | -.120 |
| Deference | 10.70 | 3.49 | .254 | .133 |
| Endurance | 12.40 | 4.14 | .050 | .048 |
| Exhibition | 14.60 | 3.70 | -.042 | -.119 |
| Heterosexuality | 16.74 | 4.81 | -.202 | .212 |
| Intracception | 17.95 | 5.26 | .076 | .040 |
| Nurturance | 16.44 | 4.83 | .037 | -.047 |
| Order | 8.37 | 3.32 | -.081 | -.146 |
| Succorance | 11.79 | 5.28 | -.012 | .082 |
| <u>STAI Scales</u> | | | | |
| A-Trait | 36.63 | 9.17 | .696 | — |
| A-State | 35.10 | 10.06 | — | .696 |

Correlations **bolded** are significant at the .05 level; correlations followed by an asterisk are significant at the .01 level.

¹Based on Form X.

Table 17 also reports correlations between the Form X scales and the *Mooney Problem Checklist* for a sample of counseling center clients. Except for future vocational and educational plans, and curriculum and teaching procedures, the correlations for the counseling center clients were essentially the same as those for the psychology students. Approximately three-fourths of the counseling center clients sought assistance for educational and vocational problems.

The high T-Anxiety scores in college students are associated with a larger number of self-reported problems in almost every area of adjustment has important practical implications and suggests that anxiety-prone students develop problems in many areas. Thus, the T-Anxiety scale appears to have potential as an effective instrument for identifying students likely to need and seek assistance in counseling centers and student health services.

Table 17
Correlations of the STAI Scales with the *Mooney Problem Checklist*
for Two Groups of College Students¹

| Problem Area | Psychology Class (N = 77) | | Counseling Center Clients (N = 83) | |
|---|------------------------------|--------------|---------------------------------------|--------------|
| | State | Trait | State | Trait |
| Health and Physical Development | .248 | .385* | .285 | .476* |
| Finances, Living Conditions, and Employment | .088 | .345* | .329* | .245 |
| Social and Recreational Activities | .306* | .385* | -.020 | .341* |
| Social-Psychological Relations | .296* | .539* | .254 | .383* |
| Personal-Psychological Relations | .458* | .623* | .246 | .492* |
| Courtship, Sex and Marriage | .257 | .450* | .103 | .341* |
| Home and Family | .185 | .359* | .116 | .299* |
| Morals and Religion | .216 | .361* | .178 | .410* |
| Adjustment to College (School) Work | .248 | .485* | .203 | .239 |
| The Future: Vocational and Educational | .276 | .496* | .100 | .050 |
| Curriculum and Teaching Procedures | .103 | .230 | .205 | .178 |

Correlations **bolded** are significant at the .05 level; correlations followed by an asterisk are significant at the .01 level.

¹Based on Form X.

Correlations of the STAI with Academic Aptitude and Achievement

It is important to determine the extent to which emotional problems contribute to academic difficulties of students. To do so requires a measure of trait anxiety that is essentially unrelated to intelligence or aptitude. To evaluate the relationship between the STAI scales and academic aptitude and achievement, Form X was administered to approximately 1,200 freshmen entering Florida State University. The following aptitude and achievement measures were available for most of these students: high school grade-point average and class rank; and scores on the *Florida Statewide Twelfth Grade Placement Test*, and achievement test given to all high school seniors. In addition the *College Entrance Examination Board* (CEEB) scores were available for approximately 15 percent of the students.

Correlations between the Form X S-Anxiety and T-Anxiety scales and each of the four measures of aptitude and achievement are presented in Table 18. These correlations were essentially zero for both the S-Anxiety and T-Anxiety scales. While it is possible that small negative correlations might be found for a more heterogeneous sample (Spielberger, 1958), it would appear that the STAI scales are essentially unrelated to aptitude and achievement for college students.

Table 18
Correlations of the STAI Scales with Measures of Academic Aptitude and Achievement¹

| | Males | | Females | |
|-------------------------|-------|-------|---------|-------|
| | State | Trait | State | Trait |
| High School GPA | -.03 | -.06 | -.02 | .00 |
| High School Rank | .00 | -.02 | .00 | .01 |
| 12th Grade Test | -.07 | -.04 | -.05 | -.06 |
| CEEB (V Plus Q) | -.02 | -.05 | -.03 | .07 |

¹Based on Form X.

Effects of Stress on State Anxiety

The construct validity of the Form X S-Anxiety scales was investigated in two studies in which the inventory was given under high- and low-stress conditions to large samples of undergraduate students at Florida State University. In the first study, the S-Anxiety scales initially administered to over 900 students with standard instructions (norm condition). These students were then asked to respond according to how they believed they would feel "just prior or the final examination in an important course" (exam condition). Table 19 includes the mean Form X S-Anxiety scores in the norm and exam conditions, reported separately for males and females, the critical ratios (CR) for the differences between these means, and the point-biserial correlations [$r(pb)$].

The mean S-Anxiety scores were substantially higher in the exam condition than in the norm condition for both sexes. The means scores for males and females were similar in the norm condition, but the females had higher scores than the males in the exam condition. The differences between the means for the two conditions, as reflected in the CRs, were highly significant for both sexes; the magnitude of the point-biserial correlations indicated that the level of S-Anxiety was strongly associated with the experimental conditions. Item analyses revealed that the scores for the females for each individual item were significantly higher in the exam condition than in the norm condition, and that the scores of the males were significantly higher in the exam condition for all but one of the items. The means, CRs, and point-biserial correlations for each item are reported in Spielberger et al. (1970).

Table 19

Mean S-Anxiety Scores for College Students under Normal and Exam Conditions¹

| | N | NORM | EXAM | CR | r (pb) |
|----------------|----------|-------------|-------------|-----------|---------------|
| Males | 332 | 40.02 | 54.99 | 24.14 | .60 |
| Females | 645 | 39.36 | 60.51 | 42.13 | .73 |

¹Based on Form X.

Additional evidence of the construct validity of the Form X S-Anxiety scale was obtained in a second study. This scale was given to 197 undergraduate college students in a single testing session under four different experimental conditions. The first administration occurred at the beginning of the experimental session (normal condition). The second administration followed a ten-minute period of relaxation training (relax condition). The students were then asked to work on the Terman (1956) *Concept Mastery Test* (CMT), which was presented to them as “a relatively easy IQ test.” They were interrupted after ten minutes for the third administration of the scale (exam condition). The final administration occurred immediately after the students viewed a stressful movie (movie condition) depicting several accidents in a woodworking shop (Lazarus & Opton, 1966).

The means, standard deviations, and alpha reliability coefficients for the Form X S-Anxiety scale in the four conditions are reported in Table 20. The mean S-Anxiety scores in the normal condition were similar to those for the college students in the normative samples reported in Table 1. The scores for the exam condition were higher than for the normal condition. While the alpha coefficients were uniformly high in all four experimental conditions, it is interesting to note that the internal consistency of the S-Anxiety scale was highest in the two most stressful experimental conditions and lowest in the relax condition.

The mean scores for males and females in the normal and exam conditions were approximately the same, as can be noted in Table 20, indicating that these conditions had a similar impact on both sexes. The movie condition appeared to be more upsetting for the females. Females also reported higher levels of S-Anxiety intensity than males in the imaginary exam condition in the first study, as was previously noted. In contrast, the relax condition seemed to reduce the level of S-Anxiety intensity more effectively for the females than for the males. These findings suggest that females are more emotionally labile than males in their reactions to highly stressful or relaxing circumstances.

Table 20
Means, Standard Deviations, Alpha Coefficients for the State Anxiety Scale
under Stressful and Nonstressful Conditions¹

| Conditions | Males (N = 104) | | | Females (N = 88) | | |
|---------------|-----------------|-------|-------|------------------|-------|-------|
| | Mean | SD | Alpha | Mean | SD | Alpha |
| MOVIE | 50.03 | 12.48 | .94 | 60.94 | 11.99 | .93 |
| EXAM | 43.01 | 11.23 | .92 | 43.69 | 11.59 | .93 |
| NORMAL | 36.99 | 9.57 | .89 | 37.24 | 10.27 | .91 |
| RELAX | 32.70 | 9.02 | .89 | 29.60 | 6.91 | .83 |

¹Based on Form X.

Table 21 reports the mean scores for individual Form X S-Anxiety items in the four conditions. Scores for most of the items increased with the amount of stress associated with the experimental conditions. The mean score for each item was lowest in the relax conditions. The mean score for each item was lowest in the relax condition and highest after the students viewed the stressful film. Item-remainder correlations for each Form X S-Anxiety item are reported in Appendix C, Table 27. Critical ratios for the differences between the means for each item in the relax condition and in the other three conditions are given in Spielberger et al. (1970). In general, the anxiety-absent items (1. I feel calm; 5. I feel at ease; 16. I feel content) discriminated better at lower levels of stress, whereas, the anxiety-present items (3. I am tense; 6. I feel upset; 17. I am worried) discriminated better at higher levels of stress.

That individual S-Anxiety items differ in their sensitivity to different degrees and kinds of stress reflects a test-theory concept that is uniquely encountered in the measurement of psychological states. This concept, previously labeled item-intensity specificity (Spielberger et al., 1970), refers to the fact that some items are more sensitive to variations in the intensity of S-Anxiety at lower levels of stress, others at high levels of stress. Since the S-Anxiety scale items cover a broad range item-intensity specificity, the inventory may be used to measure S-Anxiety under widely varying stress conditions.

Table 21
Mean Scores for Individual Items on the S-Anxiety Scale under Stressful and Nonstressful Experimental Conditions¹

| Item | College Males | | | | College Females | | | |
|--------------|---------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|
| | Relax | Norm | Exam | Movie | Relax | Norm | Exam | Movie |
| 1 | 1.54 | 1.74 | 2.39 | 2.85 | 1.32 | 1.74 | 2.35 | 3.51 |
| 2 | 1.75 | 1.77 | 2.44 | 2.56 | 1.50 | 1.81 | 2.49 | 3.03 |
| 3 | 1.30 | 1.57 | 2.11 | 2.53 | 1.14 | 1.51 | 2.08 | 3.16 |
| 4* | 1.36 | 1.36 | 1.73 | 1.99 | 1.21 | 1.46 | 1.96 | 2.61 |
| 5 | 1.56 | 1.82 | 2.44 | 2.83 | 1.51 | 1.76 | 2.54 | 3.48 |
| 6 | 1.28 | 1.33 | 1.59 | 2.18 | 1.17 | 1.38 | 1.70 | 3.18 |
| 7 | 1.73 | 2.03 | 1.74 | 2.16 | 1.64 | 2.21 | 1.67 | 2.12 |
| 8* | 1.88 | 2.40 | 2.54 | 2.88 | 1.91 | 2.52 | 2.63 | 3.13 |
| 9* | 1.59 | 2.04 | 2.06 | 2.15 | 1.39 | 1.98 | 2.06 | 2.81 |
| 10 | 1.80 | 2.10 | 2.46 | 2.77 | 1.46 | 1.93 | 2.45 | 3.40 |
| 11 | 1.81 | 1.91 | 2.53 | 2.47 | 1.82 | 2.05 | 2.84 | 2.86 |
| 12 | 1.35 | 1.53 | 1.80 | 2.47 | 1.20 | 1.51 | 1.74 | 3.05 |
| 13 | 1.20 | 1.35 | 1.58 | 2.21 | 1.13 | 1.34 | 1.58 | 2.87 |
| 14* | 1.24 | 1.41 | 1.43 | 1.76 | 1.16 | 1.46 | 1.43 | 2.47 |
| 15 | 1.70 | 1.81 | 2.42 | 2.89 | 1.50 | 2.10 | 2.60 | 3.56 |
| 16 | 1.97 | 2.32 | 2.65 | 2.84 | 1.72 | 2.22 | 2.62 | 3.41 |
| 17 | 1.68 | 1.83 | 1.75 | 2.00 | 1.45 | 1.95 | 1.81 | 2.39 |
| 18* | 1.18 | 1.18 | 1.39 | 1.86 | 1.13 | 1.25 | 1.34 | 2.50 |
| 19* | 2.70 | 3.08 | 3.23 | 3.49 | 2.53 | 2.89 | 3.22 | 3.76 |
| 20 | 2.07 | 2.40 | 2.74 | 3.16 | 1.70 | 2.17 | 2.60 | 3.63 |
| Scale | 32.70 | 36.99 | 43.01 | 50.03 | 29.60 | 37.24 | 43.69 | 60.94 |

¹Based on Form X.

*Items 4, 8, 9, 14, 18, and 19 were replaced in Form Y.

IV. Research with the STAI

The *State-Trait Anxiety Inventory* has been used extensively in research and clinical practice since its introduction more than fifteen years ago (Spielberger & Gorsuch, 1966). Research with the STAI has been stimulated by a growing consensus among clinicians and behavioral and medical scientists regarding the critical need to distinguish between the concepts of stress and anxiety, and to differentiate between anxiety as a transitory emotional state and individual differences in anxiety-proneness as a relatively stable personality trait. While the early studies were concerned primarily with the effects of stress and anxiety on learning and performance, the STAI has been used increasingly in investigations of stress-related psychiatric and medical disorders and as an outcome measure in research on biofeedback and various forms of treatment.

Nearly a decade ago, Smith and Lay (1974) published an annotated bibliography of research concerned with, or related to, the state-trait conception of anxiety. Approximately 150 references were listed, including journal articles, doctoral dissertations, and technical reports; the STAI was used to measure anxiety in 108 of these studies. Evidence of the expanded interest in state-trait anxiety research can be seen in *State-Trait Anxiety Inventory: A Comprehensive Bibliography*, which was recently compiled by the test author (Spielberger, 1989, 2nd ed.). Over 3,300 archival publications in which the STAI was used to measure anxiety are listed in this bibliography.

The major populations with which the STAI has been used include high school and college students, working adults, military personnel, and psychiatric, psychosomatic, medical, surgical, and dental patients. The STAI has also been shown to have excellent psychometric properties for the assessment of anxiety in elderly persons (Patterson et al., 1980), but it may be necessary to reprint the items, using larger type for this age group because of their diminished visual acuity (McDonald & Spielberger, 1983). Since the key words in most of the STAI items are at the sixth-grade reading level or below, the inventory can also be readily administered to junior high school students. However, the children's form (STAIC, Spielberger, 1973) is generally more effective for assessing anxiety in twelve- to fifteen-year-olds with emotional problems or reading difficulties (e.g., Finch et al., 1978; Finch et al., 1976; Finch et al., 1974).

While most studies with the STAI have been conducted by psychologists or medical researchers, the inventory has also been widely used by investigators from other disciplines: counseling and guidance, criminal justice, education, nursing, physical education and sports psychology, and speech and hearing. The inventory has also proved useful in research in anthropology, fine arts (drama and musical performance), political science and government and sociology. References to studies in these fields may be found in the comprehensive bibliography (Spielberger, 1989, 2nd ed.).

The STAI has been used extensively in psychological research to investigate the effects of anxiety on performance in *verbal learning* (e.g., Sharma & Wangu, 1976; Snyder & Katahn, 1973), *motor learning* (e.g., Hollingsworth, 1975; Miller & Harvey, 1973; Weinberg, 1979), *complex learning* (e.g., Birkhill & Schaie, 1975; Heinrich & Spielberger, 1982), *memory* (e.g., Eysenck, 1975; Gross & Mastenbrook, 1980; Mueller et al., 1979), and *computer-assisted instruction* (e.g., Hedl et al., 1973; Rappaport, 1975; Sieber et al., 1977). The inventory has also been used in numerous studies of *psychological stress* (e.g., Brook, 1976; Miller, 1979; Sarason et al., 1978; Shipley et al., 1978), *speech anxiety* (e.g., Jeger & Goldfried, 1976; Lamb, 1972; Lent et al., 1981; Slutsky & Allen, 1978), *test anxiety* (e.g., Culler & Holahan, 1980; Guidry & Randolph, 1974; Smith et al., 1982; Tobias et al., 1974), and *academic achievement* (e.g., Gilliland & Andress, 1981; Heinrich, 1979; Plake et al., 1981).

The bibliography of research with the STAI (Spielberger, 1989, 2nd ed.) reveals a marked increase in the number of studies using the STAI in investigations of psychiatric and psychosomatic disorders, and in the assessment of changes in anxiety in investigations of the treatment of these disorders. Psychiatric research with the STAI has included investigations of *neuroses* (e.g., Johnstone et al., 1980; Sipos et al., 1979; Von Richthofen & Mellor, 1980), *depression* (e.g., Gotlib & Robinson, 1982; Hollon & Kendall, 1980; Mathew et al., 1982; Mould, 1975; Shaffer et al., 1981), and *schizophrenia* (e.g., Anchor et al., 1973; Evans & Dinning, 1980; Falloon et al., 1981; Jensen, 1982; Yarnell, 1972).

The STAI has also been used extensively to investigate the role of anxiety in patients suffering from *asthma* (e.g., Alexander, 1972; Kurata et al., 1976), *headaches* (e.g., Andrasik & Holroyd, 1980; Blanchard et al., 1982; Greden et al., 1980; Hart, 1982; Mathew et al., 1980), *insomnia* (e.g., Carr-Kaffashan & Woolfolk, 1979; Johnson et al., 1974), and other forms of psychosomatic illnesses such as *colitis*, *dermatitis*, *duodenal ulcers*, and *infectious mononucleosis* (e.g., Brooks & Richardson, 1980; Garrie et al., 1974; Latimer et al., 1980; Rabavilas et al., 1980; Roark, 1971).

The STAI has been used in a number of recent studies of *hypertension* and *coronary heart disease* (e.g., Bloom, 1979; Rosemary & Chesney, 1980; Whitehead et al., 1977). While patients with hypertension generally have significantly higher T-Anxiety scores than normo-tensive patient controls (e.g., Crane, 1981), no systematic relationship has been found between anxiety and Type-A behavior, a major risk for coronary heart disease (Chesney et al., 1981). Nevertheless, the STAI was used to assess anxiety in seven of nine intervention studies designed to modify Type-A behavior (Suinn, 1982).

Use of the STAI to evaluate process and outcome in counseling, psychotherapy, relaxation training, biofeedback, and behavioral and cognitive treatment studies has increased dramatically over the past decade. With more than three hundred investigations in these areas since 1970, it is not possible here to summarize the most important findings, nor even to describe representative studies. Numerous references to treatment investigations are included in the comprehensive bibliography of research with the STAI (Spielberger, 1989, 2nd ed.). There also have been more than eighty investigations of the relation between anxiety and performance on skilled motor tasks and in sports competition (Spielberger, 1983).

The sensitivity of the S-Anxiety scale to environmental stress has been repeatedly demonstrated in research on emotional reactions to surgery. Typically, S-Anxiety scores rise immediately prior to surgery and decline as patients recuperate (Auerbach, 1973; Chapman & Cox, 1977; Spielberger, Auerbach, Wadsworth, Dunn & Taulbee, (1973). In contrast, trait anxiety scores are essentially the same before and after surgery and do not appear to be influenced by the stress of the surgical procedures. Moreover, the magnitude of elevations in S-Anxiety before surgery in other physically dangerous situations, such as the threat of shock, appear to be unrelated to individual difference in anxiety (Hodges, 1967; Hodges & Spielberger, 1966). Although T-Anxiety scores do not predict differences in emotional reactions to physical danger, persons high in trait anxiety generally respond with greater elevations in S-Anxiety to threats to self-esteem than do low T-Anxiety individuals (Hodges, 1967; Spielberger, 1966, 1972, 1977b).

Although most of the research described above and in the text of this *Manual* was based on Form X, the correlations between Form X and Y are uniformly high (see Table 7). The primary virtue of Form Y is that it is a “purer” measure of anxiety that is relatively more independent of depression than Form X. Better differentiation between anxiety and depression should prove especially useful in research on the treatment of depressed patients. Aaron T. Beck (1983), a leading authority on depression, has observed that successful treatment reduces depressive anxiety, but there is generally a corresponding increase in anxiety. Thus, “purer” measures of anxiety and depression will facilitate more accurate monitoring of desirable changes in the therapeutic process.

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Appendix A: Test Development Procedures

The development of the STAI was initiated at Vanderbilt University in 1964 by C.D. Spielberger and R.L. Gorsuch. The initial goal was to develop a relatively brief, objective, self-report research instrument to assess state and trait anxiety in college students. Test-development activities were shifted in 1967 to Florida State University and the goals broadened to include the assessment of anxiety in high school students and emotionally disturbed persons in both clinical and research contexts. From 1967 to 1970, the primary responsibility for test development rested with C.D. Spielberger and R. Lushene.

The test form and the test manual for Form X were published in 1970 (Spielberger et al., 1970). A children's form, the *State-Trait Anxiety Inventory for Children* (STAIC), was developed in 1970-72 to assess anxiety in nine- to twelve-year-old children (Spielberger, 1973). Although the STAIC was standardized on fourth-, fifth-, and sixth-grade elementary school children, it has been used successfully in group administrations with third-grade children (Papay & Hedl, 1978), and with first- and second-grade children when it is read to them and their responses are recorded by the examiner (Papay et al., 1975; Sikes, 1978).

Work on the revision of the STAI began in 1975 at the University of South Florida, Tampa. In the construction of Form Y, 30 percent of the items in Form X (six S-Anxiety and six T-Anxiety items) were replaced. Factor analyses of responses to individual items (Spielberger et al., 1980; Vagg et al., 1980), analysis of item content in the context of our current conceptions of state and trait anxiety (Spielberger, 1976, 1977a, 1977b), and the item-remainder correlations and other psychometric properties of individual items provided the major basis for revising the inventory. While many persons contributed to the revision of the STAI, Lester R. Barker, Gerard A. Jacobs, and Peter R. Vagg made major contributions to the construction and validation of Form Y.

The major steps in the construction and test development process for the STAI are summarized below. The specific procedures employed in the selection of items for the S-Anxiety and T-Anxiety scales at each critical stage of test development are described.

1. The first step was to establish a pool of items with demonstrated concurrent validity as measures of anxiety. Three widely used anxiety scales – the Taylor (1953) *Manifest Anxiety Scales* (TMAS), the Welsh (1956) *Anxiety Scale*, and the *IPAT Anxiety Scale* (Cattell & Scheier, 1963) – were administered to 288 introductory psychology students at Vanderbilt University. The students' responses to 177 individual items from these scales correlated .25 or higher with their scores on each of the three anxiety scales. These items were rewritten so that the essential psychological content was retained, but the form was altered so that each item could be used with different instructions to assess S-Anxiety and T-Anxiety.

2. A second group of undergraduate psychology majors were asked to review the rewritten items and comment in detail on the test format and the clarity of item content. On the basis of their comments, items with redundant, vague, or ambiguous content were eliminated, and the format and instructions were simplified. A total of 124 items judged to have the potential for measuring both S-Anxiety and T-Anxiety were retained for further evaluation.
3. A third sample of 54 Vanderbilt undergraduate students were given the retained items and asked to indicate how well each item described "how you generally feel" by marking "almost never," "sometimes," "often," or "almost always." After responding with these trait instructions, the students were asked to read each item again and report whether or not it described "how you feel at the present time" by marking "yes," "no," or "doesn't apply." For all items marked "yes," the students were further instructed to report the intensity of their feelings by checking "relatively weak," "moderate," or "very intense (strong)." Retained for further evaluation were items with item-remainder correlations of .35 or higher as measures of both T-Anxiety and S-Anxiety, and for which not more than 20 percent of the subjects reported, "doesn't apply."
4. The 66 items that survived stage 3 of the screening process were given to a fourth sample of college students (265 Vanderbilt undergraduates) along with brief descriptions of two hypothetical situations entitled exam and relax. The students were first asked to respond to each item by indicating how they usually or generally feel (T-Anxiety set). They were then asked to imagine they were actually in the exam situation and to respond to the STAI items according to how they believed they would feel in this situation. Similar S-Anxiety instructions were given for the relax situation. Most of these same students had also taken the TMAS and the IPAT Anxiety Scale ten weeks prior to the administration of the STAI. A total of 44 items survived all phases of this fourth stage of the item selection process described below:
 - a) The T-Anxiety responses for each item were correlated with the summed z scores for the TMAS and the IPAT Anxiety Scale. Those items for which the concurrent validity coefficient with the combined TMAS and IPAT scores was less than .20 were excluded from further consideration. An item was also eliminated if the item-remainder correlation was less than .30 for either males or females when the item was given T-Anxiety instruction.
 - b) Each individual item's potential usefulness as a measure of S-Anxiety was evaluated with a point-biserial correlation procedure that determined the extent to which an item discriminated between the exam and the relax situations (Spielberger & Gorsuch, 1966). S-Anxiety scores for most items were significantly higher for the exam situation than for the relax situation, but only those items that significantly discriminated between the two situations for both males and females were retained for further validation.

5. The 44 items that met all of the criteria for stage 4 were administered to a large sample of Vanderbilt University freshmen (561 males, 249 females). These items were given first with T-Anxiety instructions, then with S-Anxiety vicarious relax instructions, and, finally, with S-Anxiety by situation point-biserial correlations, and correlations among the individual items were computed separately for males and females for each item. A total of 33 items had T-Anxiety item-remainder correlations equal to or greater than .24 for both males and females, and S-Anxiety point-biserial correlations which significantly discriminated between the relax and exam situations. Two items were highly correlated with one another in the T-Anxiety analysis and were judged to be almost identical in content. After eliminating one of these items, there were 32 items with acceptable psychometric properties as measures of both T-Anxiety and S-Anxiety.
6. Stage 6 in the STAI item-selection and validation process focused on further evaluation of the validity of individual items as measures of S-Anxiety. The items selected in stage 5 were given with S-Anxiety instructions on two occasions to approximately 400 Vanderbilt undergraduates enrolled in an introductory psychology course. This 32-item S-Anxiety scales was first given during a regular class period on non-examination day, and then readministered two months later at the beginning of the period during which the students took the final examination for the course. The extent to which scores on each item changed was determined by calculating point-biserial correlations, separately for males and females, between individual item scores and the exam versus relax conditions. The point-biserial correlations for 23 of the 32 items were significant for both sexes.
7. The 20 items that best met the criteria established for measuring S-Anxiety in stage 6 were selected for Form A of the STAI. Each of these items had previously met the stringent item-validation procedures described above for measuring T-Anxiety. Therefore, the 20 items constituting Form A of the STAI were reasonably good measures of both S-Anxiety and T-Anxiety.
8. The correlation between the Form A S-Anxiety and T-Anxiety subscales was moderately high, due in large measure to the fact that the same items were used to measure both state and trait anxiety. Form B was constructed to minimize the correlation between the subscales by using a different set of items to assess S-Anxiety and T-Anxiety. The Form B S-Anxiety scale consisted of the 20 Form A items, given with state instructions; the Form B T-Anxiety scale comprised 20 items not included in Form A, which had the best psychometric properties for the assessment of T-Anxiety as described in stage 4. Many of the T-Anxiety items in Form B were better T-Anxiety measures than the items included in Form A, but were not acceptable measures of S-Anxiety.

9. The T-Anxiety items in Forms A and B were rated on a 4-point scale, whereas the S-Anxiety items were rated on a 5-point scale. Moreover, one of the rating categories for the S-Anxiety scale (“This statement does not describe my feelings, conditions, etc.”) was considered ambiguous by a number of subjects. Therefore, in an effort to reduce confusion and make the S-Anxiety and T-Anxiety scales structurally more similar, the ambiguous category was eliminated. In the revised S-Anxiety format, subjects were instructed to report how they feel “right now . . . at this moment” by checking one of the following categories: not at all, somewhat, moderately so, or very much so. In addition, individual S-Anxiety items were altered to stress the immediacy of the feelings the subjects were asked to report. This was done by adding phrases to the item statements such as “right now,” “presently,” “at the moment,” and “at this time.” Thus, Form B (Revised) consisted of the same items as Form B, but it differed from Form B in that the S-Anxiety items were rated on a 4-point scale and a majority of the items emphasized the immediacy of subjects’ feelings.
10. To evaluate the relation between the revised Form B and other measures of anxiety, the inventory was given to a sample of over 300 Florida State University undergraduates along with the TMAS, the IPAT Anxiety Scale, and the *General* and *Today* Forms of the AACL. The results of this study showed that the S-Anxiety and T-Anxiety scales were highly correlated with other standard measures of state and trait anxiety. Form B (Revised) was also administered to a second sample of students (486 males; 575 females) enrolled in introductory psychology courses at Florida State University to provide the normative data reported in the first *STAI Preliminary Test Manual* (Spielberger et al., 1967).
11. Prior to publishing the STAI, the modifier terms (e.g., “right now,” “at present”) that had been inserted in the S-Anxiety items in Form B (Revised) to emphasize the immediacy of the subjects’ feelings were eliminated, because these modifiers made the items less adaptable to situations in which subjects were required to report how they felt in a therapy session or while working on an experimental task. Moreover, the emphasis on immediate feelings in individual items was unnecessary if the S-Anxiety set was emphasized in the instructions. The content of each T-Anxiety and S-Anxiety item was reviewed to identify items that might be considered objectionable for use with high school and college populations. Objectionable items were replaced with items of similar content and equivalent psychometric properties, yet worded in a manner judged to be less offensive. Form B (Revised) items were compared with 20 items drawn from the STAI item pool on the basis of their demonstrated validity as measures of T-Anxiety, 20 additional items of demonstrated S-Anxiety validity drawn from prior research with the STAI, and new items constructed on the basis of related research on the measurement of state anxiety (Nowlis, 1965; Nowlis & Green, 1965; Zuckerman, 1960; Zuckerman & Biase, 1962).

12. The items from Form B (Revised), along with the potential replacement items, were administered to a sample of Florida State University undergraduates (139 females; 124 males) enrolled in an introductory psychology course. The S-Anxiety items were administered twice during the same testing session; first, with standard instructions (normal condition), and then with instructions to respond according to how they believed they would feel while taking an examination in their psychology course (exam condition). Item-remainder correlations were computed for each T-Anxiety and S-Anxiety item, and point-biserial correlations were determined for each S-Anxiety item with the normal and exam conditions. Six T-Anxiety items and seven S-Anxiety items were replaced with items of comparable content, but worded in a more acceptable manner. The item-remainder correlations for each of the 13 replacement items were equal to or greater than the correlation for the item it replaced. Each S-Anxiety replacement item also discriminated between the normal and the exam conditions better than the item it replaced. The revised form of the STAI that resulted from this item-replacement process was designated as Form X: The *STAI Manual* for Form X was published in 1970 (Spielberger et al., 1970).
13. The revisions in Form X that were carried out in constructing and validating Form Y, the present form of the scale, were described by Spielberger et al. (1980) and Vagg et al. (1980), and are summarized in section III of this *Manual*. The selection of the replacement items for Form Y was based primarily on factor analyses and content analysis of the individual items of Form X along with potential replacement items. The results of the factor analyses are summarized in Appendix B. Additional information about the psychometric properties of the individual S-Anxiety and T-Anxiety items that comprise Form Y are reported in Appendix C.
14. Examination of the relationship between Form Y scores and age revealed that working adults of both sexes above the age of 50 tended to be low in S-Anxiety and T-Anxiety than their younger colleagues. To further examine the relationship between anxiety and age, the normative sample of working adults was sub-divided into eight age groups. The means and standard deviations of the anxiety scores of male and female working adults from age 25 to age 69 are reported in Table 22. The S-Anxiety and T-Anxiety scores at each age level were quite similar, suggesting that the S-Anxiety scale was given under average (relatively neutral) stress conditions. The mean S-Anxiety and T-Anxiety scores for males from age 25 through age 59 were remarkably consistent, as were those for females from age 30 through age 49. The youngest group of females had substantially higher anxiety scores than any other group; older subjects of both sexes had lower anxiety scores, especially the females.

Table 22
Means and Standard Deviations for the STAI Scales
for Working Adults in Eight Age Groups

| | Age: | 25-29 | | 30-24 | | 35-39 | | 40-44 | |
|------------------|------|-------|------|-------|------|-------|------|-------|------|
| | Sex: | M | F | M | F | M | F | M | F |
| S-Anxiety | | | | | | | | | |
| Mean | | 36.8 | 39.5 | 36.1 | 35.0 | 36.2 | 36.4 | 35.6 | 36.3 |
| SD | | 9.6 | 12.1 | 10.5 | 10.0 | 9.7 | 11.7 | 9.9 | 10.5 |
| N | | 57 | 46 | 147 | 62 | 193 | 69 | 259 | 80 |
| T-Anxiety | | | | | | | | | |
| Mean | | 36.6 | 39.4 | 34.8 | 35.7 | 35.2 | 34.8 | 34.9 | 36.0 |
| SD | | 10.3 | 11.4 | 9.2 | 8.9 | 9.3 | 9.1 | 8.7 | 8.7 |
| N | | 57 | 46 | 147 | 61 | 192 | 68 | 260 | 80 |

| | Age: | 45-49 | | 50-54 | | 55-59 | | 60-69 | |
|------------------|------|-------|------|-------|------|-------|------|-------|------|
| | Sex: | M | F | M | F | M | F | M | F |
| S-Anxiety | | | | | | | | | |
| Mean | | 36.5 | 35.9 | 34.6 | 32.6 | 35.0 | 31.5 | 32.1 | 32.4 |
| SD | | 11.0 | 11.9 | 10.1 | 7.3 | 11.0 | 9.4 | 8.9 | 10.4 |
| N | | 305 | 55 | 199 | 50 | 131 | 38 | 53 | 22 |
| T-Anxiety | | | | | | | | | |
| Mean | | 35.3 | 33.7 | 34.2 | 32.4 | 34.0 | 32.0 | 33.0 | 30.7 |
| SD | | 9.2 | 9.4 | 9.0 | 7.5 | 8.8 | 9.0 | 8.5 | 7.5 |
| N | | 307 | 55 | 197 | 50 | 131 | 38 | 53 | 19 |

Appendix B: Factor Structure of the STAI

The factor structure of Form Y was evaluated for a sample of 424 tenth-grade high school students (202 males; 22 females). The inventory was administered with standard instructions to groups of 20 to 30 students by their teachers during regular class periods. The students recorded their responses on IBM machine scoreable answer sheets. Any student who failed to respond to three or more items on either the S-Anxiety or T-Anxiety scales was eliminated from the study. When only one or two items were omitted, a weighted scores of 2 was inserted for each blank item.

In analyzing the data, males and females were treated as independent samples. The *Statistical Package for the Social Sciences* (SPSS) was used in the data analyses (Nie et al., 1975). The forty STAI items were factored, using the principal axis method of factor extraction, with squared multiple correlations as estimates of communality. For each sample, the eigenvalues were plotted against the eigenvectors; and Cattell's (1966) screen test, and the "breaks" criterion suggested by Cliff and Hamburger (1967) and Pennell (1968), were used to determine the number of factors to be extracted and rotated by varimax.

The rotated solutions were compared for simple structure, parsimony, and psychological meaningfulness. An optimal factor solution was defined as satisfying both Thurstone's (1947) and Kaiser's (1958) notions of simple structure, in which each variable (item) loads unambiguously on one, and only one, factor. Thus, an optimal solution would be one in which all of the items loaded unambiguously on meaningful factors, that is, factors interpretable within the context of relevant theoretical constructs.

The scree-breaks criteria suggested that two to four factors should be rotated. To allow for the inexact nature of these tests, however, and to ensure that no meaningful factor would be overlooked, two to five factors were rotated for both males and females. Each solutions was then examined for simple structure, parsimony, psychological meaningfulness, and invariance across sex. The two-, three-, and five-factor solutions were considered unsatisfactory. The four-factor solutions, which had good simple structure, could be meaningfully and parsimoniously interpreted, and were practically identical for both sexes, are reported in Table 23.

For both sexes, Factor I (State Anxiety Present) was defined almost exclusively by S-Anxiety present items, e.g., 9. "I feel frightened" and 12. "I feel nervous." Factor II (State Anxiety Absent) was defined primarily by S-Anxiety absent items, e.g., 1. "I feel pleasant" and 23. "I feel satisfied with myself." Finally, Factor IV (Trait Anxiety Present) was defined exclusively by T-Anxiety present items, e.g., 22. "I feel nervous and restless" and 31. "I have disturbing thoughts."

Form Y's factor structure was further evaluated for a sample of 1,728 male U.S. Air Force recruits at the Basic Military Training School, Lackland Air Force Base, San Antonio, Texas. Since the recruits responded to the STAI within two days of reporting for basic training, the inventory was administered under more stressful conditions than in the study described above.

A total of 27 subjects who failed to respond to three or more items were eliminated; for recruits who left only one or two S-Anxiety or T-Anxiety items blank, a value of 2 was assigned as the score for each omitted item.

The scores for the forty Form Y items were factored separately for males and females, using the same procedures and criteria for factor extraction described above. The scree-breaks test suggested that two to four factors should be extracted, and two to five factors were rotated by varimax to ensure that no meaningful solution was overlooked. The three- and five-factor solutions were lacking simple structure, parsimony, and psychological meaning. The two-factor and four-factor solutions both had good simple structure and could be meaningfully interpreted. These solutions are presented in Table 24, along with the unrotated eigenvalues and the labels assigned to each factor.

In the two-factor solution, all twenty S-Anxiety items had salient loadings on Factor I (State Anxiety). Seventeen of the twenty T-Anxiety items had salient loadings on Factor II (Trait Anxiety) and the remaining three T-Anxiety items also had their highest loadings on this factor. Thus, the results for the two-factor solutions provided strong empirical support for the conceptual distinction between state and trait anxiety.

In the four-factor solutions, Factor I was composed entirely of the ten S-Anxiety absent items; all but one of these items had salient loadings. Factor II was defined by salient loadings on all nine T-Anxiety absent items, plus one T-Anxiety present item (22. I feel nervous and restless). Factor III was defined by salient loadings on nine of the ten S-Anxiety present items, and Factor IV had salient or high loadings on nine of eleven T-Anxiety present items. Thus, the state and trait anxiety factor identified in the two-factor solution were each divided into anxiety-present and anxiety-absent factors.

The factor analysis for the Air Force sample was compared with the results obtained in the factor analysis for the male high school students described above, using Cattell's (1966) congruent factors (confactor) approach. All of the confactor correlations were greater than .90, providing striking evidence of congruence of the corresponding factor identified in the two samples and further strong support for the state-trait distinction in the measurement of anxiety (Vagg et al., 1980).

The identification of separate trait and state anxiety factors in the two-factor studies of Form Y described above were generally consistent with the results in five investigations of Form X in which all forty items were factored together (Baker et al., 1977; Gaudry & Poole, 1975; Gaudry et al., 1975; Kendall et al., 1976; Spielberger et al., 1980). Distinctive anxiety-absent and -present factors identified in the four-factor solutions for Form Y were also reported in previous factor studies of Form X, but the factor structure for Form Y was more differentiated and more stable than the structure for Form X, reflecting a better balance of anxiety-present and anxiety-absent items in Form Y, and the effects of replacing a number of items with weak psychometric properties (Spielberger et al., 1980).

Table 23
Factor Structure of Form Y for High School Males (N=202) and Females (N=222)¹

| STAI-Y item | FACTOR I | | FACTOR II | | FACTOR III | | FACTOR IV | |
|--------------------|------------------------------|-------|-----------------------------|-------|-----------------------------|-------|------------------------------|-------|
| | Females | Males | Females | Males | Females | Males | Females | Males |
| 1 | | | 61 | 62 | | | | |
| 2 | | | 62 | 50 | | | | |
| 3 | 52 | (37) | | | | | | |
| 4 | 61 | 49 | | | | | | |
| 5 | | | 68 | 55 | | | | |
| 6 | 71 | | | | | | | |
| 7 | 49 | 42 | | | | | | |
| 8 | | | 50 | 53 | | | | |
| 9 | 60 | 57 | | | | | | |
| 10 | | | 66 | 71 | | | | |
| 11 | | | 53 | | | | | |
| 12 | 69 | 50 | | | | | | |
| 13 | 60 | 57 | | | | | | |
| 14 | 52 | | | | | | | |
| 15 | | | 68 | 58 | | | | |
| 16 | | | 57 | 58 | | | | |
| 17 | 66 | 47 | | | | | | |
| 18 | 65 | 64 | | | | | | |
| 19 | | | 59 | 51 | | | | |
| 20 | 43 | | 54 | 61 | | | | |
| 21 | | | | | 50 | 41 | | |
| 22 | 42 | | | | | 41 | 46 | 44 |
| 23 | | | | | 59 | 50 | | |
| 24 | | | | | | 41 | 46 | 42 |
| 25 | | | | | | | (38) | 46 |
| 26 | | | | 48 | 61 | 52 | | |
| 27 | | | | | 52 | 53 | | |
| 28 | | | | | | | 57 | 51 |
| 29 | | | | | | | 58 | 60 |
| 30 | | | | | 58 | (39) | | |
| 31 | | | | | | | 60 | 64 |
| 32 | | | | | | 58 | (38) | |
| 33 | | | | | 66 | 49 | | |
| 34 | | | | | 40 | 52 | | |
| 35 | | | | | | | (37) | 43 |
| 36 | | | | 44 | | | | |
| 37 | | | | | 57 | | 65 | 63 |
| 38 | | | | | | | 69 | 47 |
| 39 | | | | (39) | 62 | | | |
| 40 | | | | | | | 55 | 51 |
| Factor Name | State Anxiety Present | | State Anxiety Absent | | Trait Anxiety Absent | | Trait Anxiety Present | |

¹ Only loadings above .40 are reported. For items with no salient loadings, highest loadings are reported in parentheses. Decimal points have been omitted, and the factors for the high school males have been reordered to match the order for the females.

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Table 24: Factor Structure of Form Y for Air Force Recruits (N=1728)¹

| Form Y item | Two-factor solution | | Four-factor solution | | | |
|-----------------------------|----------------------|----------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|
| | I | II | I | II | III | IV |
| 1 | .64 | | .54 | | .38 | |
| 2 | .59 | | .60 | | | |
| 3 | .68 | | .39 | | .57 | |
| 4 | .54 | | | | .44 | |
| 5 | .66 | | .64 | | | |
| 6 | .59 | | | | .52 | |
| 7 | .49 | | | | | .39 |
| 8 | .54 | | .59 | | | |
| 9 | .58 | | | | .56 | |
| 10 | .67 | | .71 | | | |
| 11 | .42 | | .39 | | | |
| 12 | .66 | | | | .70 | |
| 13 | .59 | | | | .64 | |
| 14 | .46 | | | | .40 | |
| 15 | .68 | | .69 | | | |
| 16 | .48 | | .64 | | | |
| 17 | .61 | | | | .49 | .37 |
| 18 | .57 | | | | .47 | |
| 19 | .58 | | .60 | | | |
| 20 | .60 | | .65 | | | |
| 21 | | .60 | | .63 | | |
| 22 | | .51 | | .45 | | |
| 23 | | .62 | | .59 | | |
| 24 | | .36 | | (.28) | | |
| 25 | | .50 | | .36 | | .41 |
| 26 | | .56 | | .56 | | |
| 27 | | .63 | | .66 | | |
| 28 | | .48 | | | | .49 |
| 29 | | .43 | | | | .51 |
| 30 | | .72 | | .73 | | |
| 31 | | .46 | | | | .62 |
| 32 | | .46 | | | | .38 |
| 33 | | .70 | | .67 | | |
| 34 | | .47 | | .45 | | |
| 35 | | .46 | | | | .43 |
| 36 | | .60 | | .60 | | |
| 37 | | .37 | | | | .59 |
| 38 | | (.32) | | | | .43 |
| 39 | | .54 | | .49 | | |
| 40 | .36 | .38 | | | | .47 |
| Factor Name | State Anxiety | Trait Anxiety | State Anxiety absent | Trait Anxiety absent | State Anxiety present | Trait Anxiety present |
| Unrotated eigenvalue | 12.25 | 3.19 | 12.25 | 3.19 | 2.39 | 1.19 |

¹ Only salient loading above .40 are reported. For items with no salient loadings, highest loadings are indicated in parentheses. Adapted and reproduced from *Personality and Individual Differences* by P.R. Vagg, C. D. Spielberger, and T.P. O'Hearn, Jr., copyright 1980 by permission of Pergamon Press, Ltd.

Appendix C: Data on the Internal Consistency and Validity of Individual STAI Items

Item-remainder correlation coefficients for Form Y S-Anxiety and T-Anxiety items are reported in Table 25 for the normative sample of working adults, and in Table 26 for the normative samples of students and military recruits. These coefficients were uniformly high for both males and females in all of the normative groups. Except for the high school males and the females in the 50-60 age group, the median coefficients were greater than .50 for all of the groups. Only one of the 440 coefficients was below .30, and only six were below .35. In general, the correlations were slightly higher for the S-Anxiety items than for the T-Anxiety items.

The Form X S-Anxiety scale was administered to undergraduate college students during a regular class period in a normal classroom setting (normal), immediately after relaxation training (relax), immediately following a difficult IQ test (exam), and after viewing a stressful film (movie). The item-remainder correlation coefficients for individual S-Anxiety items in these four conditions are reported in Table 27. In general, the coefficients for each of the twenty items were higher in the more stressful conditions than in the relaxed conditions.

Critical ratios for the differences between the means for individual items in the four experimental conditions revealed that all twenty items successfully discriminated between the relax and movie conditions for females, and all but one item discriminated between the relax and exam conditions for the females, and eighteen did so for the males. As might be expected, the individual S-Anxiety items were least effective in discriminating between the relax and normal conditions, apparently reflecting a “floor effect” in the scale. Nevertheless twelve items significantly discriminated between the two relatively nonstressful condition for the females, and ten items discriminated for the males.

Table 25

**Item-Remainder Correlations for the STAI Scales for
Working Adults in Three Age Groups**

| Item No. | S-Anxiety Scale | | | | | | Item No. | T-Anxiety Scale | | | | | |
|-------------------------|-----------------|-----|-------|-----|-------|-----|-------------------------|-----------------|-----|-------|-----|-------|-----|
| | 19-39 | | 40-49 | | 50-69 | | | 19-39 | | 40-49 | | 50-69 | |
| | M | F | M | F | M | F | | M | F | M | F | M | F |
| 1 | 68 | 68 | 72 | 74 | 67 | 60 | 21 | 58 | 57 | 60 | 56 | 61 | 67 |
| 2 | 61 | 60 | 62 | 60 | 60 | 60 | 22 | 56 | 52 | 61 | 60 | 56 | 47 |
| 3 | 60 | 59 | 59 | 68 | 70 | 53 | 23 | 60 | 60 | 61 | 63 | 52 | 49 |
| 4 | 58 | 68 | 64 | 72 | 62 | 67 | 24 | 48 | 47 | 38 | 41 | 33 | 37 |
| 5 | 62 | 65 | 68 | 68 | 63 | 41 | 25 | 54 | 54 | 56 | 69 | 53 | 49 |
| 6 | 61 | 66 | 64 | 68 | 62 | 48 | 26 | 54 | 49 | 51 | 54 | 54 | 57 |
| 7 | 59 | 57 | 49 | 40 | 39 | 33 | 27 | 71 | 65 | 66 | 64 | 68 | 69 |
| 8 | 55 | 55 | 58 | 64 | 61 | 49 | 28 | 55 | 68 | 56 | 61 | 50 | 45 |
| 9 | 47 | 52 | 49 | 48 | 38 | 42 | 29 | 60 | 50 | 46 | 38 | 52 | 49 |
| 10 | 67 | 62 | 73 | 66 | 67 | 54 | 30 | 67 | 70 | 66 | 77 | 64 | 59 |
| 11 | 47 | 55 | 44 | 61 | 45 | 57 | 31 | 54 | 60 | 56 | 55 | 54 | 42 |
| 12 | 62 | 71 | 69 | 70 | 69 | 67 | 32 | 56 | 50 | 43 | 57 | 35 | 50 |
| 13 | 52 | 58 | 64 | 62 | 68 | 56 | 33 | 67 | 69 | 71 | 74 | 63 | 68 |
| 14 | 50 | 45 | 47 | 44 | 40 | 41 | 34 | 55 | 50 | 50 | 59 | 48 | 49 |
| 15 | 74 | 68 | 72 | 78 | 74 | 65 | 35 | 48 | 59 | 47 | 60 | 49 | 35 |
| 16 | 62 | 71 | 66 | 77 | 64 | 63 | 36 | 67 | 61 | 65 | 75 | 67 | 61 |
| 17 | 64 | 68 | 61 | 60 | 63 | 53 | 37 | 51 | 41 | 43 | 41 | 50 | 42 |
| 18 | 42 | 57 | 58 | 49 | 44 | 33 | 38 | 46 | 47 | 35 | 31 | 34 | 38 |
| 19 | 61 | 65 | 68 | 66 | 60 | 60 | 39 | 63 | 63 | 63 | 61 | 54 | 52 |
| 20 | 64 | 66 | 67 | 63 | 61 | 71 | 40 | 61 | 71 | 59 | 56 | 53 | 48 |
| Median | 61 | 64 | 64 | 65 | 62 | 55 | Median | 56 | 58 | 56 | 60 | 53 | 49 |
| Alpha Coeff. | .92 | .93 | .93 | .94 | .92 | .90 | Alpha Coeff. | .92 | .92 | .91 | .92 | .90 | .89 |
| N | 446 | 210 | 560 | 136 | 384 | 109 | N | 446 | 210 | 559 | 135 | 382 | 106 |

Table 26
Item-Remainder Correlations for the STAI Scales for Students and Military Recruits

| Item No. | State-Anxiety Scale | | | | | Item No. | Trait-Anxiety Scale | | | | |
|--------------|---------------------|-----|----------------------|-----|-------------------|--------------|---------------------|-----|----------------------|-----|--------------------------------|
| | College Students | | High School Students | | Military Recruits | | College Students | | High School Students | | Military Recruits ¹ |
| | M | F | M | F | M | | M | F | M | F | M |
| 1 | 50 | 52 | 57 | 66 | 64 | 21 | 51 | 49 | 55 | 46 | 52 |
| 2 | 50 | 54 | 47 | 61 | 62 | 22 | 52 | 53 | 64 | 61 | 54 |
| 3 | 60 | 56 | 42 | 58 | 64 | 23 | 63 | 67 | 61 | 61 | 55 |
| 4 | 55 | 59 | 44 | 60 | 53 | 24 | 49 | 52 | 42 | 53 | 38 |
| 5 | 69 | 65 | 56 | 72 | 65 | 25 | 58 | 60 | 57 | 53 | 52 |
| 6 | 52 | 66 | 41 | 70 | 59 | 26 | 46 | 47 | 57 | 50 | 52 |
| 7 | 54 | 59 | 46 | 59 | 53 | 27 | 44 | 37 | 52 | 50 | 58 |
| 8 | 60 | 69 | 49 | 63 | 59 | 28 | 59 | 58 | 59 | 57 | 56 |
| 9 | 54 | 58 | 31 | 58 | 58 | 29 | 60 | 51 | 46 | 50 | 49 |
| 10 | 63 | 63 | 51 | 65 | 68 | 30 | 64 | 55 | 53 | 56 | 63 |
| 11 | 51 | 60 | 44 | 51 | 49 | 31 | 60 | 58 | 56 | 60 | 53 |
| 12 | 53 | 55 | 40 | 71 | 65 | 32 | 47 | 60 | 54 | 50 | 50 |
| 13 | 50 | 52 | 43 | 64 | 59 | 33 | 69 | 69 | 59 | 55 | 66 |
| 14 | 39 | 47 | 28 | 52 | 47 | 34 | 38 | 40 | 49 | 44 | 44 |
| 15 | 48 | 64 | 55 | 68 | 68 | 35 | 55 | 61 | 47 | 43 | 51 |
| 16 | 56 | 67 | 35 | 55 | 53 | 36 | 60 | 68 | 41 | 49 | 54 |
| 17 | 60 | 70 | 46 | 71 | 63 | 37 | 42 | 47 | 43 | 63 | 46 |
| 18 | 54 | 69 | 39 | 64 | 58 | 38 | 40 | 45 | 41 | 41 | 39 |
| 19 | 59 | 60 | 44 | 60 | 63 | 39 | 60 | 59 | 43 | 57 | 53 |
| 20 | 61 | 64 | 54 | 71 | 63 | 40 | 58 | 58 | 58 | 54 | 49 |
| Median | 54 | 60 | 44 | 64 | 61 | Median | 57 | 57 | 54 | 53 | 52 |
| Alpha Coeff. | .91 | .93 | .86 | .94 | .93 | Alpha Coeff. | .90 | .91 | .90 | .90 | .89 |
| N | 296 | 481 | 202 | 222 | 1893 | N | 324 | 531 | 202 | 222 | 1893 |

¹ Males only

In the measurement of state and trait anxiety, all forty Form Y items should be used whenever time and circumstances permit. When the entire inventory is given with standard conditions, it is more meaningful to compare the scores that are obtained with the appropriate normative samples. For research and clinical applications in which there is insufficient time to administer the entire STAI, the item-remainder correlations reported in Tables 25-27 should be taken into account in selecting subsets of items with optimal psychometric properties for estimating anxiety level.

Table 27
Item-Remainder Correlations for S-Anxiety Scale
Under Stressful and Non-stressful Experimental Conditions¹

| Item | RELAX | | NORMAL | | EXAM | | MOVIE | |
|------|-------|----|--------|----|------|----|-------|----|
| | M | F | M | F | M | F | M | F |
| 1 | 53 | 40 | 59 | 63 | 64 | 71 | 71 | 61 |
| 2 | 48 | 56 | 63 | 69 | 79 | 62 | 68 | 74 |
| 3 | 50 | 38 | 54 | 72 | 49 | 49 | 72 | 66 |
| 4 | 46 | 46 | 24 | 26 | 43 | 35 | 45 | 57 |
| 5 | 65 | 59 | 69 | 60 | 76 | 72 | 72 | 70 |
| 6 | 49 | 11 | 52 | 54 | 66 | 60 | 64 | 71 |
| 7 | 61 | 33 | 47 | 48 | 40 | 38 | 45 | 32 |
| 8 | 60 | 40 | 44 | 36 | 48 | 49 | 59 | 37 |
| 9 | 50 | 34 | 32 | 50 | 35 | 67 | 41 | 58 |
| 10 | 64 | 43 | 57 | 53 | 76 | 73 | 69 | 65 |
| 11 | 46 | 61 | 60 | 62 | 70 | 66 | 65 | 54 |
| 12 | 37 | 29 | 52 | 69 | 54 | 72 | 74 | 77 |
| 13 | 45 | 12 | 52 | 64 | 55 | 69 | 78 | 73 |
| 14 | 61 | 38 | 46 | 60 | 56 | 49 | 68 | 65 |
| 15 | 53 | 61 | 65 | 74 | 72 | 75 | 58 | 71 |
| 16 | 70 | 59 | 65 | 63 | 71 | 71 | 72 | 58 |
| 17 | 50 | 32 | 62 | 59 | 53 | 61 | 58 | 50 |
| 18 | 44 | 47 | 63 | 37 | 57 | 63 | 68 | 60 |
| 19 | 15 | 28 | 18 | 25 | 29 | 45 | 28 | 34 |
| 20 | 46 | 39 | 46 | 56 | 57 | 68 | 52 | 64 |

¹Based on Form X

Appendix D: Foreign-Language Forms of the STAI

The past decade has witnessed a growing consensus among researchers with regard to the nature of anxiety as a transitory emotional state and individual differences in anxiety as a personality trait. Clearly stated conceptual definitions of state and trait anxiety have also facilitated the construction and validation of foreign-language forms of the STAI (Spielberger & Diaz-Guerrero, 1976,1983), and the experience gained in adapting the STAI for use in different cultures has provided impressive evidence of the universality of these concepts.

Spielberger and Sharma (1976) have reviewed the specific strategies used in constructing the Spanish (Spielberger & Diaz-Guerrero, 1975; Spielberger et al., 1971) and the Hindi (Spielberger et al., 1973) language forms of the STAI. In addition to discussing general issues pertinent to the cross-cultural assessment of anxiety, they identified four critical steps in adapting the STAI for use in a new language and culture: (1) preparation of a preliminary translation in the second language; (2) evaluation of the translation by experts on both subject matter and language; (3) establishing the cross-language equivalence of the original and translated scales; and (4) empirically demonstrating the reliability and validity of the new scale.

Five foreign-language adaptations of the STAI and one of the STAIC are available from the publishers listed below. Since the amount of research conducted with the adaptations differs greatly, investigators should request information about psychometric properties of the adaptation when ordering test forms.

Additional research translations of the STAI have been made in thirty languages and of the STAIC in nine languages.

Researchers who are interested in developing foreign-language adaptations of the STAI or STAIC must secure permission in advance. Go to www.mindgarden.com/translations.htm

**State-Trait Anxiety Inventory
for Adults**

Self-Evaluation Questionnaire
STAI Form Y-1 and Form Y-2

Developed by Charles D. Spielberger

in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Sample

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SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name _____ Date _____ S _____

Age _____ Gender (Circle) **M** **F** T _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then blacken the appropriate circle to the right of the statement to indicate how you feel *right now*, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NOT AT ALL
SOMEWHAT
MODERATELY SO
VERY MUCH SO

- 1. I feel calm..... 1 2 3 4
- 2. I feel secure..... 1 2 3 4
- 3. I am tense..... 1 2 3 4
- 4. I feel strained..... 1 2 3 4
- 5. I feel at ease..... 1 2 3 4
- 6. I feel upset..... 1 2 3 4
- 7. I am presently worrying over possible misfortunes..... 1 2 3 4
- 8. I feel satisfied..... 1 2 3 4
- 9. I feel frightened..... 1 2 3 4
- 10. I feel comfortable..... 1 2 3 4
- 11. I feel self-confident..... 1 2 3 4
- 12. I feel nervous..... 1 2 3 4
- 13. I am jittery..... 1 2 3 4
- 14. I feel indecisive..... 1 2 3 4
- 15. I am relaxed..... 1 2 3 4
- 16. I feel content..... 1 2 3 4
- 17. I am worried..... 1 2 3 4
- 18. I feel confused..... 1 2 3 4
- 19. I feel steady..... 1 2 3 4
- 20. I feel pleasant..... 1 2 3 4

Sample

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name _____ Date _____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate you *generally* feel.

ALMOST NEVER
SOMETIMES
OFTEN
ALMOST ALWAYS

- 21. I feel pleasant 1 2 3 4
- 22. I feel nervous and restless 1 2 3 4
- 23. I feel satisfied with myself..... 1 2 3 4
- 24. I wish I could be as happy as others seem to be 1 2 3 4
- 25. I feel like a failure..... 1 2 3 4
- 26. I feel rested..... 1 2 3 4
- 27. I am "calm, cool, and collected" 1 2 3 4
- 28. I feel that difficulties are piling up so that I cannot overcome them..... 1 2 3 4
- 29. I worry too much over something that really doesn't matter..... 1 2 3 4
- 30. I am happy..... 1 2 3 4
- 31. I have disturbing thoughts..... 1 2 3 4
- 32. I lack self-confidence..... 1 2 3 4
- 33. I feel secure..... 1 2 3 4
- 34. I make decisions easily 1 2 3 4
- 35. I feel inadequate..... 1 2 3 4
- 36. I am content..... 1 2 3 4
- 37. Some unimportant thought runs through my mind and bothers me..... 1 2 3 4
- 38. I take disappointments so keenly that I can't put them out of my mind 1 2 3 4
- 39. I am a steady person..... 1 2 3 4
- 40. I get in a state of tension or turmoil as I think over my recent concerns and interests..... 1 2 3 4

Sample

**State-Trait Anxiety Inventory
for Adults
Scoring Key**

Developed by Charles D. Spielberger
in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Sample

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State-Trait Anxiety Inventory for Adults Scoring Key (Form Y-1, Y-2)

Developed by Charles D. Spielberger in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

To use this stencil, fold this sheet in half and line up with the appropriate test side, either Form Y-1 or Form Y-2. Simply total the scoring **weights** shown on the stencil for each response category. For example, for question # 1, if the respondent marked 3, then the **weight** would be 2. Refer to the manual for appropriate normative data.

| | NOT AT ALL SOMEWHAT MODERATELY SO VERY MUCH SO | | | | | ALMOST NEVER SOMETIMES OFTEN ALMOST ALWAYS | | | | | | | | | |
|-----------------|---|---|---|---|--|---|---|---|---|-----------------|-----|---|---|---|---|
| Form Y-1 | | | | | | | | | | Form Y-2 | | | | | |
| 1. | 4 | 3 | 2 | 1 | | | 4 | 3 | 2 | 1 | 21. | 4 | 3 | 2 | 1 |
| 2. | 4 | 3 | 2 | 1 | | | 1 | 2 | 3 | 4 | 22. | 1 | 2 | 3 | 4 |
| 3. | 1 | 2 | 3 | 4 | | | 4 | 3 | 2 | 1 | 23. | 4 | 3 | 2 | 1 |
| 4. | 1 | 2 | 3 | 4 | | | 1 | 2 | 3 | 4 | 24. | 1 | 2 | 3 | 4 |
| 5. | 4 | 3 | 2 | 1 | | | 1 | 2 | 3 | 4 | 25. | 1 | 2 | 3 | 4 |
| 6. | 1 | 2 | 3 | 4 | | | 4 | 3 | 2 | 1 | 26. | 4 | 3 | 2 | 1 |
| 7. | 1 | 2 | 3 | 4 | | | 4 | 3 | 2 | 1 | 27. | 4 | 3 | 2 | 1 |
| 8. | 4 | 3 | 2 | 1 | | | 1 | 2 | 3 | 4 | 28. | 1 | 2 | 3 | 4 |
| 9. | 1 | 2 | 3 | 4 | | | 1 | 2 | 3 | 4 | 29. | 1 | 2 | 3 | 4 |
| 10. | 4 | 3 | 2 | 1 | | | 4 | 3 | 2 | 1 | 30. | 4 | 3 | 2 | 1 |
| 11. | 4 | 3 | 2 | 1 | | | 1 | 2 | 3 | 4 | 31. | 1 | 2 | 3 | 4 |
| 12. | 1 | 2 | 3 | 4 | | | 1 | 2 | 3 | 4 | 32. | 1 | 2 | 3 | 4 |
| 13. | 1 | 2 | 3 | 4 | | | 4 | 3 | 2 | 1 | 33. | 4 | 3 | 2 | 1 |
| 14. | 1 | 2 | 3 | 4 | | | 4 | 3 | 2 | 1 | 34. | 4 | 3 | 2 | 1 |
| 15. | 4 | 3 | 2 | 1 | | | 1 | 2 | 3 | 4 | 35. | 1 | 2 | 3 | 4 |
| 16. | 4 | 3 | 2 | 1 | | | 4 | 3 | 2 | 1 | 36. | 4 | 3 | 2 | 1 |
| 17. | 1 | 2 | 3 | 4 | | | 1 | 2 | 3 | 4 | 37. | 1 | 2 | 3 | 4 |
| 18. | 1 | 2 | 3 | 4 | | | 1 | 2 | 3 | 4 | 38. | 1 | 2 | 3 | 4 |
| 19. | 4 | 3 | 2 | 1 | | | 4 | 3 | 2 | 1 | 39. | 4 | 3 | 2 | 1 |
| 20. | 4 | 3 | 2 | 1 | | | 1 | 2 | 3 | 4 | 40. | 1 | 2 | 3 | 4 |

Sample