UNFOLDING THE COOPERSMITH SEI: A VALIDITY STUDY

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To the Graduate Council

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A Thesis

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Degree

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DEDICATION

This thesis is dedicated to my wife,

Julie Anna Strasshofer

for her support, enduring patience, and love these past twenty-four years

without whom my life would not be as full

and without whose encouragement, I may never have gotten this far,

to my children,

Joshua, Jennifer, William III, Rebecca, Benjamin, and Deborah

who have endured many days and nights without their father

and yet still encouraged me on in my pursuits,

and to my parents,

William Edward Strasshofer, Sr. and

Carol Ann Strasshofer

who started me off on the sure foundation of love

undergirded by faith in Jesus Christ my Lord.

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ABSTRACT

Since the early 1960s, many researchers have pointed out weaknesses in self-concept measures, and have called for continued validation efforts. Due to the inconclusiveness of past efforts, it has been suggested that newer methods of analysis be employed. One method which has not been used in this area of study is the unfolding model. Though not as well know as factor analysis, unfolding may be the better choice when developing and analyzing measures of bipolar concepts, since factor analysis often will find an additional factor when there is none. In addition, the unfolding method assigns a numerical position to each of the items and to each of the participants responding to the items. This provides valuable information regarding the completeness, or incompleteness, of the scale in question. This study analyzed the popular Coopersmith Self-Esteem Inventory using a Graded Unfolding Model. Problems with the scale were discovered, particularly in regards to items related to high self-esteem.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
II.	REVIEW OF THE LITERATURE	6
	The Coopersmith Self-Esteem Inventory	6
	The Unfolding Model	19
	The Generalized Graded Unfolding Model (GGUM)	23
III.	PURPOSE AND FORMAT	25
	Purpose	25
	Hypotheses	26
	Method	27
IV.	RESULTS	29
V.	DISCUSSION	32
	Discussion	32
	Conclusion	36
VI.	LIST OF REFERENCES	38
VII.	APPENDICES	47
	A. Approval Letter	47
	B. Table 1	48
	C. Figure 1	49
	D. Table 2	50
	E. Figures 2a-22y	54
	Vita	59

Chapter I

Introduction

In 1961, Wylie published a comprehensive review of the literature regarding self-concept research. Among many of the studies, she discovered "a good deal of ambiguity" and "considerable . . . contradiction" (p. 317). She suggested that this was due to the lack of clear theory, the lack of uniform definitions, and the lack of good instrumentation. She reported that, despite the many and varied types of measures available, most instruments had little, if any, psychometric support. In light of this, she suggested that researchers begin to focus on establishing the reliability and construct validity of their instruments before continuing their investigations into the various issues of self-concept. During the same time period, Crowne and Stephens (1961) echoed Wylie's concerns. They suggested that the problems found among the self-concept research stemmed largely from the "neglect of several crucial psychometric and methodological principles," and like Wylie, they called for an intensive focus on validating the various self measures (p. 119). However, years would pass with little progress in this area.

In 1974, Wylie again published a review of the literature. Once again, she criticized the quality of the instruments. Concerning measures of self-esteem, she concluded that either there existed "no such measurable dimension as overall self-esteem," or the scales designed to measure it were doing a "poor job of it" (p. 101). In 1979, she again emphasized that there continued to exist considerable problems with the theories, methods, and measurements being applied to the study of self-concept issues. Shavelson,

Hubner, and Stanton (1976) concluded that little had changed in the twelve years since issues of self-concept measurement were first criticized (Crowne & Stephens, 1961; Wylie, 1961), and they suggested that "interpretations" based on many measures may be invalid (p. 408). Others have echoed these concerns, while noting the general lack of attention to the problem (Byrne, 1983; Demo, 1985; Gecas, 1982). Shavelson, Hubner, and Stanton (1976) suggested making use of "advances in construct validation methodology" to help resolve these issues (p. 410).

One method of scale construction, validation, and analysis that may prove useful but which has not been used in this area of study is the unfolding model. This is a method that, similar to factor analysis, can be used to determine the number of factors, or dimensions, represented by the items of a scale (Coombs & Kao, 1960). In addition, this method assigns a numerical position to each of the items and to each of the participants who respond to the items (Roberts & Laughlin, 1996a, 1996b; Roberts, 1998). On the one hand, this allows the items to be rank ordered, and reveals the distance "between their positions" along the theoretical continuum (Andrich, 1988, p. 34). This, in turn, allows the researcher to see how well the dimension is being represented by the items and to discover any pronounced gaps that might exist between scale items, which would indicate an inadequate, or at least an incomplete, representation of the construct in question (Andrich & Styles, 1998; Roberts & Laughlin, 1996a). On the other hand, this allows researchers to discover where each individual respondent is located along the dimension in question relative to the items, rather than merely determining how each individual ranks in relation to the other participants. Both of these aspects make the unfolding model a useful and a

valuable method for analyzing data.

This unfolding methodology has been available for many years (Coombs, 1954; Coombs, 1964; Coombs & Kao, 1960), but due to complicated calculations, and the fact that it has not been included in computer-based statistical packages, it has never gained popularity (van Schuur & Kiers, 1994). However, the present widespread availability and use of computers, coupled with the ease of program development, has revitalized interest in this method as a means of scale development and analysis, especially for scales which attempt to measure bipolar attitudes (van Schuur & Kiers, 1994).

Often, when factor analysis is used to analyze data collected by scales designed to assess a bipolar attitude, an additional factor is found when it is not expected (Coombs & Kao, 1960; van Schuur & Kiers, 1994). This "extra factor phenomenon" results from the factor analysis treating the two opposing halves of a bipolar dimension, often represented by positively and negatively worded items, as independent factors (Andrich & Styles, 1998; van Schuur & Kiers, 1994, p. 107). This, then, leads to some confusion, leaving researchers to guess as to whether the results truly indicate the presence of two factors, or if the results merely reflect the positive and negative aspects of the scale. In light of this, van Schuur and Kiers, (1994) have determined that it is not appropriate to use factor analysis in situations where bipolar attitudes are being assessed, and that the appropriate form of analysis in these situations is an unfolding model. And, since self-esteem is typically treated as a bipolar concept (viewed as ranging from low self-esteem to high self-esteem), the unfolding model appears to be an appropriate choice for analyzing self-esteem instruments in an attempt to provide additional psychometric information as called

for in the literature.

The purpose of this study is to analyze the Coopersmith Self-Esteem Inventory (SEI) using Robert's Graded Unfolding Model (GUM) (Coopersmith, 1959, 1967, 1989; Roberts & Laughlin, 1996a, 1996b; Roberts, 1998). The SEI has been, by far, one of the more popular and most widely used measures of self-esteem (Johnson, Redfield, Miller, & Simpson, 1983; Lawton, Fergusson, & Horwood, 1989; Myhill & Lorr, 1978; Roberson & Miller, 1986). The confidence placed upon it and the volume of research outcomes that have depended upon it necessitates that it does what it purports to do. Therefore, this is a particularly good scale to examine. It is a long accepted measure of global self-esteem, originally designed to be used with school aged children, and later modified to produce a shortened Adult Form (Coopersmith, 1959, 1967, 1989). For this study, the Adult Form will be used.

Factor analyses have revealed the SEI's complexity and its bipolar nature (Ahmed, Valliant, & Swindle, 1985; Kokenes, 1978; Robinson & Shaver, 1973), suggesting the unfolding model as an appropriate analysis to use for investigating this scale. The original scale was designed by gathering together a pool of possible items and then asking five psychologists to separate them into two different groups, items representing high self-esteem and items representing low self-esteem (Coopersmith, 1959, 1967, 1989). Those items for which there was the greatest amount of agreement were selected for use in the final scale. Therefore, one would expect the items to be arranged in such a way as to form two different ends of the scale, making the results of the factor analyses not too surprising. With this in mind, however, it is easy to imagine that this scale might be lacking in items

necessary to adequately represent positions between the two extremes of high and low self-esteem. If this is true, then individuals who should be placed midway between the two extremes are most likely receiving scores that represent a lower level of self-esteem than they truly possess. This, then, could result in making erroneous conclusions about the relationship of self-esteem to other variables.

Chapter II

Literature Review

Coopersmith Self-Esteem Inventory

The Coopersmith Self-Esteem Inventory (SEI) was created by Stanley Coopersmith (1959) to fill the need for a measure that was able to distinguish individuals with high self-esteem from those with low self-esteem. At the time, there was interest in issues related to self-esteem, and it was believed that self-esteem was a key factor in the development and maintenance of behavior. However, little research had been undertaken to determine how significant self-esteem really was and what dynamics were involved. Coopersmith felt this was largely due to the "absence of an adequate method" for measuring this construct, and therefore set out to create one (p. 87). Coopersmith (1967) used the SEI in a series of studies over a period of six years examining both the antecedents that influence the development of self-esteem, and the consequences related to various levels of self-esteem. For his studies, and for the purpose of designing the SEI, Coopersmith defined self-esteem as an evaluative attitude toward oneself that an individual develops and typically sustains over time. This attitude toward oneself is one of "approval or disapproval," and is determined by the subjective evaluation of how "capable, significant, successful, and worthy" an individual believes him- or herself to be (p. 5). Coopersmith also believed that an individual's level of self-esteem may not be consistent across the many conditions that define one's role such as life experiences, gender, and age. Therefore, he included items on the SEI which related not only to self but also to family

experiences, peer relationships, and social activities.

In a review of measures related to self-esteem and similar constructs, the SEI has been by far one of the more popular and most widely used measures of self-esteem (Johnson, Redfield, Miller, & Simpson, 1983; Lawton, Fergusson, & Horwood, 1989; Myhill & Lorr, 1978). Crandall (1973) listed the SEI fifth in "perceived overall quality" (p. 57). Kokenes (1978) suggested it was the best available at that time. Blascovich and Tomaka (1991) reported that in the literature concerning self-esteem and self-concept, the SEI was the second most frequently cited measure. Although it is over forty years old, the SEI continues to be a popular instrument and continues to be used in current research (Bracken, Bunch, Keith, & Keith, 2000; Brown, Reedy, Fountain, Johnson, & Dichiser, 2000; Chapman & Mullis, 2000; Herz & Gullone, 1999; Sotelo, 2000). The SEI has been used to evaluate and validate many other instruments including, the Lawrence Self-Esteem Questionnaire (LAWSEQ; Hart, 1985), the Hopelessness Scale for Children (Kazdin, Rodgers, & Colbus, 1986), the Self-Esteem Rating Scale for Children - Revised (SERSC; Chiu, 1987), the Children's Reports of Parental Behavior Inventory (CRPBI; Kawash & Clewes, 1988), the Internal Control Index (ICI; Meyers & Wong, 1988), and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; McCurdy & Kelly, 1997; Strassberg, Clutton, & Korboot, 1991).

Format & Administration

For the original version of the SEI, Coopersmith (1959) gathered together a collection of items related to self-esteem. Though Coopersmith wrote several original items, most of these items were obtained from a scale developed by Rogers and Dymond

(1954), which were rewritten for children between the ages of 8 and 10 (Coopersmith, 1959; Coopersmith, 1967). These items were then sorted by five psychologists into two groups: items related to high self-esteem and items related to low self-esteem. Any items that were deemed ambiguous or repetitious were excluded, as well as those over which there was disagreement. The remaining items were evaluated for comprehension by administering them to a group of 30 children. The final form of the original inventory was made up of 50 items related to attitudes in four different realms: personal interests, one's peers, one's parents, and school (Coopersmith, 1959, 1967). At some point, 8 additional items were included as a lie scale, so that the original scale now contains 58 items (Adair, 1984; Coopersmith, 1989). It is a pencil and paper test and individuals respond to each item statement by checking one of two choices, "like me" or "unlike me" (Coppersmith, 1959, 1967, 1989).

There now exist three forms of the SEI: the original version known as the School Form or Form A, a School Short Form or Form B, and an Adult Form or Form C (Adair, 1984; Coopersmith, 1989). The School Form is used much more than either the School Short form or the Adult Form (Adair, 1984). It is intended for use with children between the ages of eight and fifteen. This form contains the original 50 items pertaining to self-esteem and the 8 Lie Scale items for a total of 58 items. Also provided are six different scores: General Self Subscale Score, Social Self-Peers Subscale Score, Home-Parents Subscale Score, School-Academic Subscale Score, Total Self Score, and a Lie Scale Score. The School Short Form was created by performing an item analysis of the School Form (Bedeian, Teague, & Zmud, 1977; Coopersmith, 1989). The twenty-five School

Form items with the "highest item-total correlations" were selected for this form (p. 7). These twenty-five items are identical to the first twenty-five items on the current School Form (Adair, 1984). The School Short Form provides only a "Total Self" score (Coopersmith, 1989; p. 9). A correlation coefficient of .86 was obtained between the total scores of the School Form and the School Short Form. Like the School Form, the School Short Form is intended for use with children between the ages of eight and fifteen. The Adult Form is a modified version of the School Short Form. It is intended of use with individuals older than fifteen years of age (Coopersmith, 1989). The language of the items and the situations presented in them were altered "to make them more meaningful" to individuals who are less connected to school and parents (Coopersmith, 1989, p. 7; Myhill & Lorr, 1978). The items were written at an eighth grade reading level (Adair, 1984). As with the School Short Form, the Adult Form provides only a "Total Self" score (Coopersmith, 1989; p.9). A correlation coefficient of .80 was obtained between the total scores of the School Short Form and the total scores of the Adult Form.

Each of these forms can be administered both to individuals and in groups (Coopersmith, 1989). The manual suggests that "explanatory remarks . . . be kept to a minimum" and provides a sample introduction (p. 8). It is also suggested that reference not be made to either self-esteem, self-concept, or self-evaluation. The term self-esteem does not appear on any of the three forms, they are merely labeled as Coopersmith Inventory. For both the School Form and the School Short Form, it is suggested that the directions printed on the inventories be read aloud while having children follow along. Then the children should be asked to respond to the practice item provided on the form. If

it appears that they understand, then they may be instructed to proceed with the rest of the items. The Adult Form is designed to be self-administered; however, the manual suggests that if any question exists concerning the individual's ability to understand the directions, then the above procedure should be followed for this form as well. Adair (1984) suggests that the directions be read to all populations. No information is given concerning how long the it should take to complete the inventories. However, the author enlisted members of his family to respond to the inventories. They were able to complete the School Form in 5 to 6 minutes and were able to complete both the School Short Form and the Adult Form in 2-1/2 to 3 minutes. Adair (1984) suggests that completion time for the School Form will vary by age of the participant, but that it rarely exceeds 10 minutes.

The Coopersmith Self-Esteem Inventories are published by Consulting Psychologists Press, Inc. (2000). Only the School Form and the Adult form are presently offered in the on-line catalog. The School Form Item Booklets cost $16.00 per package of 25, and the Adult Form Item Booklets cost $14.40 per package of 25. Scoring Keys are available for both forms and cost 12.60 each. The SEI Manual, which covers both forms, costs $20.10 per copy. Preview kits are also available which include 25 Item Booklets (for the appropriate form), scoring keys, and SEI manual for the cost of $31.50.

Scoring

Scoring is a simple and straightforward procedure. Regardless of the form of the SEI used, there is a scoring key included with each package of forms (Adair, 1984; Coopersmith, 1989). Using the associated key, each item marked in the appropriate direction receives 1 point. On both the School Short Form and the Adult Form, the total

points (25 possible) is multiplied by 4 to obtain the Total Scale score. This permits a possible total self-esteem scale score of 100. On the School Form the total points related to self-esteem (50 possible) is multiplied by 2 (the 8 lie scale items are not included in this process). This, too, permits a possible total self-esteem scale score of 100. This allows the total self-esteem scale scores from the three different forms to be compared (Coopersmith, 1989, p. 9). Those points for items belonging to each of the 4 subscales of the School Form (General Self, Social Self-Peers, Home-Parents, and School-Academic) and the Lie Scale are added up separately to get each of those scale scores. These scores are not multiplied by a constant. The School Form can be hand-scored and a total score calculated within 2 minutes (Adair, 1984). The Short Form and the Adult Form can be scored in less than a minute. The manual indicates that machine scoring is available (Coopersmith, 1989).

"There are no exact criteria for high, medium, and low levels of self-esteem" (Coopersmith, 1989, p. 9), which makes "interpretation . . . difficult" (Adair, 1984, p. 230). The manual states that scores "should and will vary" depending upon the sample (p. 9). It therefore provides two general guidelines: 1) use the SEI in conjunction with other measures and develop local norms, and 2) consider the upper quartile to represent those with high self-esteem, the lower quartile to represent those with low self-esteem, and the inter-quartile range to represent those with "medium self-esteem" (p. 9). On the School Form, it is suggested that high Lie Scale scores (8 is the highest) indicate either a defensive response or an attempt to answer positively to each item and may invalidate the inventory (Adair, 1984; Coopersmith, 1989). No criteria or suggestions were given as to

how one should interpret the individual subscales. It may be conjectured that, if the total self-esteem score is low, one might look at the subscale scores to determine what areas seem most effected.

Normative Sample

Coopersmith's final form of the inventory, consisting of 50 items, was first administered to 83 "middle-middle- to upper-middle-class" 5th and 6th grade children, consisting of 40 boys and 43 girls (Coopersmith, 1959, p. 87). These initial scores ranged from 40-100 resulting in a mean of 82.3, a standard deviation of 11.6, and a distribution "skewed in the direction of high self-esteem" (p. 87). The mean score for the females was not significantly different from the mean score for the males. A five-week test-retest reliability of .88 was obtained utilizing 30 of the original 5th grade students.

In his study regarding the antecedents of self-esteem, Coopersmith (1967) administered the inventory to 1,748 children attending public school in central Connecticut. Though his work reported that this second sample was "more diverse in ability, interest, and social background" than the first sample, more specific detail was not provided. However, another portion of his study suggests that they were "middle class, . . . white, and normal" (Coopersmith, 1967, p. 8). Normal was defined as possessing no "serious symptoms of stress or emotional disorder" (p. 8). The range of scores obtained by this sample was not reported, nor was the total mean and standard deviation. However, the females had a mean score of 72.2 with standard deviation of 12.8, and the males had a mean score of 70.1 with a standard deviation of 13.8. No significant difference was found between these scores. Again, the distribution was skewed in the direction of high self-

esteem. A three-year test-retest reliability of .70 was obtained utilizing 56 children from this sample. Although there exists some literature providing psychometric data for both the School Short Form and the Adult Form of the SEI (Adair, 1984; Bedian, et al, 1977; Chiu, 1985; Coopersmith, 1989; Gibbs & Norwich, 1985; Lall, Jain, & Johnson, 1996; Ryden, 1978), no documentation regarding normative data and sample characteristics was discovered.

Originally designed for and used with middle-class white students in the U.S., the SEI has been since used with a variety of other populations including African American, Asian, Australian, Canadian, English, Filipino, Indian, Native American, New Zealand, Puerto Rican, Spanish, & Vietnamese individuals (Bracken & Howell, 1991; Byrne, 1983; Chapman & Mullis, 2000; Francis, 1997; Francis & Wilcox, 1995; Herz & Gullone, 1999; Kokenes, 1978; Kozeluk & Kawash, 1990; Lawton, Fergusson, & Horwood, 1989; McCurdy & Kelly, 1997; Prewitt Diaz, 1984; Scruggs & Mastropieri, 1983; Sethi & Calhoun, 1986; Sotelo, 2000; Spatz & Johnston, 1973; Watkins & Astilla, 1980; Zirkel & Gable, 1977).

Reliability

Test-Retest

For the School Form, Byrne (1983) reported an initial test-retest coefficient of .63, .64 at 1 year, and two scores of .31 and .55 at 3 years. Coopersmith (1967, 1989) reported coefficients of .88 at 5 weeks and .70 at 3 years. Watkins and Astilla (1980) reported a coefficient of .61 at 9 months in their study of female Filipino students.

On the Short Form, Bedeian, et al, (1977) reports test-retest coefficients of .80 for

males and .82 for females. Chiu (1985) reported coefficients by grade level: 4th grade .85, 5th grade .73, 6th grade .76, and 7th grade .80. Split-Half coefficients were reported for the School Form only. Byrne (1983) reported a coefficient range of .87-.90 and Crandall (1973) reported a .90 coefficient.

Internal Consistency

For the School Form, Ahmed, et al. (1985) reported a .75 Cronbach-Alpha coefficient. Bryne (1983) cites studies, including two dissertations reporting Alpha coefficients .80-.92 in the ranging. Johnson, et al. (1983) reported Coefficient Alphas for the general scale and each subscale: General Self-Esteem .86, General Self .71, Home-Parents .61, School-Academic .61, Social Self-Peers .61, and .63 for the Lie Scale. Spatz and Johnston (1973) reported KR-20 coefficients by grade level: 5th grade .81, 9th grade .86, 12th grade .80. Prewtitt Diaz (1984) a Coefficient Alpha of .85 for a Puerto Rican Spanish translation.

For the Short Form, Bedeian, et al, (1977) reported KR-20 coefficients of .73 and .71. Crandall (1973) reported a .13 Inter-item correlation.

Validity

Content Validity

The SEI appears to have Face Validity. The original pool of items were given to 5 psychologists who then sorted them as to low or high self-esteem (Coopersmith, 1967, 1989; Robinson & Shaver, 1973). Items that were either redundant or ambiguous were thrown out. There was no mention in the literature as to the item content being

questioned.

Convergent Validity

For the School Form, correlation coefficients were reported for the following measures: The Self-Perception Inventory .63, the Derived Picture Test .60, the Acceptance Scale of the California Psychological Inventory .45, the Rosenberg's Self-Esteem Scale (SES) .58 & .60 (Byrne, 1983), the Multidimensional Self-Concept Scale .73, Piers-Harris Children's Self-Concept Scale .83 (Bracken & Howell, 1991), the Piers-Harris Self-Concept Scale .63 (Johnson, et al., 1983), the Battle Culture-Free Self-Esteem Inventory .86 (Kozeluk & Kawash, 1990), the Soares Scale .63, the Derived Picture Test .60 (Crandall, 1973), Rosenberg SES .68 (McCurdy & Kelly, 1997), Rosenberg SES for boys .47 and for girls .54 (Francis & Wilcox, 1995) and, with teacher ratings of self-esteem a range of .23-.62 was reported (Watkins & Astilla, 1980).

For the Short Form, Crandall (1973) reported correlations of .59 and .60 with the Rosenberg SES. Correlation with the original School Form yielded coefficients of .95 (Robinson & Shaver, 1973) and .86 (Shavelson, Hubner,& Stanton, 1976). Shavelson, Hubner, and Stanton (1976) reported of their finding that "since this was a part-whole correlation, it is spuriously high" (p. 425).

Divergent Validity

For the School Form, Ahmed, et al. (1985) reported that "subject's scores correlated negatively and significantly with guilt as measured by Buss-Durkee Scale of Guilt" (p.1239), "providing support to construct validity" (p. 1240). However, no coefficient was provided.

For the School Form, correlation coefficients were provided for the following measures. The Brookover Self-Concept of Ability Scale .35 & .34 (Bryne, 1983). The Behavioral Academic Assessment Scale .47 and Children's Social Desirability Scale .17 (Johnson, et al., 1983). The Edwards Social Desirability Scale .75, the Marlowe-Crowne Social Desirability Scale, and the CPI Self-Acceptance Scale .45 (Crandall, 1973).

Factorial Validity

For the School Form, various studies produced differing outcomes. Ahmed, et al. (1985) found four factors which suggest the SEI "is not a homogenous scale" (p. 1239). However acknowledging that the SEI is made up of four subscales intended to measure self in four areas, they added this may account for the four factors which may actually indicate that it is a homogenous scale (Ahmed, 1985). Using two college samples, Robinson and Shaver (1973) reported that "four factors emerged" (p. 84). Roberson and Miller (1986) performed a principal components factor analysis and ten factors emerged with an "eight factor solution" being the "most meaningful" (p. 271). Kokenes (1978) found "bipolar factors" and referred to the SEI as "a factorially complex instrument" (p. 154). Roberson and Miller (1986), too, reported the SEI as a "complex" instrument (p. 271).

Discussion

Although many of the psychometric properties reported in the literature appear to be supportive, using the SEI appears problematic. First there is the question of dimensionality. Is this "complex" instrument measuring one construct called self-esteem, or several similar constructs (Kokenes, 1978, p. 154; Roberson & Miller, 1986, p. 271)?

In many cases, when bipolar attitudes such as self-esteem are analyzed using factor analysis, 2 factors are found when it is not expected (Coombs & Kao, 1960; van Schuur & Kiers, 1994). It is therefore considered "inappropriate" to use factor analysis in situations where bipolar attitudes are being assessed, and that the appropriate form of analysis in these situations is an unfolding model (van Schuur & Kiers, 1994, p. 99). Why the different studies cited previously found 10, 4, and 2 factors is uncertain (Ahmed, et al,.1985; Kokenes, 1978; Roberson & Miller, 1986; Robinson & Shaver, 1973); however, it does suggest the need for determining if Coopersmith's Inventories are uni- or multi-dimensional. It is beyond the scope of this study to explore the larger School Form with its subscales. Yet, it is within the scope of this study to explore the dimensionality of the shorter Adult Form, which is supposed to represent the one construct of General Self-Esteem.

A second issue is that "there are no exact criteria for high, medium, and low levels of self-esteem" (Coopersmith, 1989, p. 9), which as Adair (1984) pointed out makes "interpretation . . . difficult"(p. 230). Assigning the top quartile as high self-esteem and the bottom quartile as low self-esteem is ambiguous at best. Truly with this system, one cannot say that one person has high or low self-esteem. The only thing that can be said is that they possess higher or lower self-esteem in relation to other study participants. As to those in the inter-quartile range being designated as medium, those at the lowest point of those two inter-quartiles and those at the highest point of those two inter-quartiles are assessed as equal relative to their level of self-esteem. This problem of criteria is, too, beyond the scope of this study. However, a related issue that is within its scope may shed

some light on this problem.

When items are chosen for a measure, such as the SEI (Coopersmith, 1967, 1989), by focusing on the two poles of the construct (i.e. low self-esteem vs. high self-esteem), it can be expected that those items are located at the "extremes of the continuum with a gap in the middle" (Andrich & Styles, 1998, p. 467). That is, there is a portion of the continuum unrepresented, or at least under represented, by items related to "medium self-esteem" (Coopersmith, 1989, p. 9). This poses a couple of problematic possibilities. One, the selected items may be so closely located to each other at the two extremes, that they do not adequately discriminate individuals who are located in those areas. Two, there will certainly be those individuals who are located in this unrepresented area of the continuum. Depending on how large a distance is unrepresented, it is possible to imagine individuals located in significantly different locations in this portion of the continuum yet have very similar scale scores. This is something the unfolding model can help us determine.

The Coopersmith SEI (Coopersmith, 1967, 1989) is a well respected and widely used instrument. Much research in the area of self-esteem has been performed using this instrument and much of our understanding of self-esteem is due to the use of this instrument. Because of its wide acceptance, ease of use, and the fact that it is to some degree a standard by which other instruments are measured, its continued use must be considered whenever performing research in the area of self-esteem. It seems, then, that it would be important to use new methods of measure validation, as they become available, to continue assessing the SEI's validity and accuracy.

The Unfolding Model

The unfolding model, existing for almost 4 decades, is not a new concept. This method was thoroughly described, explained, and demonstrated in Coombs' Theory of Data back in1964. Similar to factor analysis, the unfolding method is capable of determining what items share characteristics and most likely represent the same construct (Coombs, 1954; Coombs, 1964; Coombs and Kao, 1960; Roberts, 1996). However, unfolding goes a step beyond by identifying those items that more closely represent linear constructs (Andrich, 1988, Coombs, 1964; Roberts, 1995). It is capable of not only determining which items are similar, for example those representing self-esteem, but also how items relate to each other along the construct continuum by degree. The process assigns a numerical value to each item allowing the researcher to see how they are located along the continuum in relation to each other. In addition, the unfolding method assigns a numerical value to each participant's position along the theoretical continuum, giving a more accurate picture of how individuals relate to each other, and to the items, along the construct (Coombs 1964, Roberts, 1996; van Schuur & Keys, 1994). Coombs (1964) stated that while some data methods are best used as a "scaling criterion" for item evaluation and others as a "scaling method" for measure construction, the unfolding model proves to be equally useful in both areas.

When constructing a scale, the desire is to locate items on a linear continuum so that they "reflect not only the order of their intensity . . . but also the distance between their positions" (Andrich, 1988). Because this is exactly what an unfolding model does,

Roberts, Laughlin, and Wedell (1997) recommend that researchers use an unfolding model when constructing attitude measures made up of agree-disagree responses. As a scaling criterion, the unfolding model allows the researcher to determine which items, from a sample pool of items, lie along the proposed continuum and how they relate to each other in degree (Andrich, 1988; Coombs, 1964). As a scaling method, the ability to assign a numerical position to items allows the researcher to process a large pool of items, determine which ones appear to lie along the same continuum, and then pick the smallest number of evenly spaced items to represent the continuum on a scale (Roberts 1996; Roberts 1998; Roberts & Laughlin, 1996a, 1996b). With this method it is possible to design an accurate measure, with optimal error characteristics, made up of as few as 15-20 items. This of course allows the construction of a scale that can obtain the desired information, while also being time efficient. This in turn avoids participants growing weary of responding to many items and not giving their full attention to the task of responding accurately. Finally, the assignment of a numerical value to individual location allows researchers to conduct more accurate attitude studies.

When it comes to assigning values for individual locations, it is important that the scale in question was constructed using the unfolding method or at least follows the unfolding model (Roberts, 1996; Roberts 1998; Roberts & Laughlin, 1996a, 1996b; Roberts, Personal Communication, January 1, 2001). The unfolding model can accurately locate items, even if the scale in question does not follow the unfolding model. However, it cannot accurately locate individual positions. In order to evaluate a particular scale's scoring system by comparing participant scale scores to the participant unfolded individual

locations, the scale must follow the unfolding model (Roberts, Personal Communication, January 1, 2001). Otherwise the scale scores are derived from another model and are not compatible to the unfolded ideal point values. If, however, the scale in question follows the unfolding model, scale scores can be correlated with ideal point values. This may give some insight into the precision of the scale scoring system. It is expected, based on item choice and scale type, that the Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1959, 1967, 1989) will fit the unfolding model allowing the evaluation of its scoring system.

Assumptions

The unfolding model follows the Item Response Theory of preferential choice data resulting in an ideal point process (Coombs, 1964; Roberts, 1996; Roberts, 1998; Roberts & Laughlin, 1996a, 1996b; Roberts, Donoghue, & Laughlin, 2000). The assumption is that both individuals and attitudes, represented by scale items, exist in a psychological space. Some attitudes lie along a linear continuum and an individual has an ideal point on that attitude continuum. The individual then responds to each item to the degree that it is close to her ideal point, preferring those items closest to his or her location. The data is made up of pairs, or dyads, corresponding to the individual and to a stimulus item. Both the individual and the stimulus item are located on a continuum in the psychological space (Coombs, 1964). By responding positively to an item, the individual indicates that his or her ideal point is in someway close to the stimulus point. Additionally, the individual may respond positively, or negatively, from either above a stimulus point or from below it (Roberts, 1996).

Recent Progress

Although unfolding methodology has been available for many years (Coombs, 1954; Coombs, 1964; Coombs & Kao, 1960), it has never gained popularity due to complicated algorithm calculations, and to the fact that it has not been included in computer-based statistical packages, (Andrich & Styles, 1998; van Schuur, & Kiers, 1994). However, the present widespread availability and use of computers, coupled with the ease of program development, has revitalized interest in this method as a means of scale development and analysis, especially for scales which attempt to measure bipolar attitudes such as self-esteem "that spans the two poles of negative and positive affect" (Roberts, Donoghue, & Laughlin, 2000, p. 3; van Schuur, & Kiers, 1994). This renewed interest has led to the development of many types of unfolding models. There exist several models that unfold agree-disagree responses. Some are designed for use with binary responses (Andrich, 1988; Andrich & Luo, 1993, Hoitjink, 1990, 1991), and some are designed for use with both graded responses and binary responses (Andrich, 1996; Roberts & Laughlin, 1996a, 1996b). Some of these models are parametric models, while others are non-parametric models (Roberts, Donoghue, & Laughlin, 2000). The Generalized Graded Unfolding Model (GGUM; Roberts, 1996; Roberts, 2000; Roberts, Donoghue, & Laughlin, 2000) is a parametric model suitable for use with both binary and graded responses.

Generalized Graded Unfolding Model (GGUM)

In 1996, Roberts investigated the underlying theories of Thurstone and Likert scale methodology and the relative precision of instruments constructed by those methods. He found that the Thurstone method followed the ideal point process and produced more valid results, while the Likert method followed a dominance process and produced more precise results. He also found that the Likert method provided better discrimination at the extremes of a scale while tending to overlook mid-range responses which the Thurstone method accounts for. He then developed the Graded Unfolding Model (GUM) that combines the best of both methods, yielding both valid and precise results across the length of the scale in question. The GUM is particularly useful in designing attitude scales, but is also quite valuable for evaluating existing scales. The GUM can be used with binary or graded data and can simultaneously estimate the locations of both the item stimulus points (θ) and the individual ideal points (δ) using a single set of agree-disagree data (Roberts, 1996; Roberts & Laughlin, 1996a, 1996b).

The Generalized Graded Unfolding Model (GGUM) in its most recent form is available in a free downloadable system software package, the GGUM2000 (Roberts 2000; Roberts, Donoghue, & Laughlin, 2000), and is the result of continued work in this area. The GGUM2000 provides 8 unfolding models for the processing of various types of data. As in the past, the newest version of the GGUM is suitable for use with either Thurstone or Likert data sets, binary or graded. For the purpose of this present study, the 8th configuration, the generalized model, GGUM, will be used. It can be used with as little

as 15-20 items and 100 participants. It simultaneously locates both items and individuals along the attitude continuum under investigation, it provides data for determining if the scale in question fits the unfolding model, and it provides fit statistics for both the stimulus items and the individuals. For the purpose of this study, the program command file configuration will be executed using recommended and default values provided in the software manual (Roberts, 2000).

Chapter III

Purpose and Format

Purpose

Since the early 1960s, many researchers have pointed out weaknesses in self-concept measures, and have called for continued validation efforts. Due to the inconclusiveness of past efforts, it has been suggested that newer methods of analysis be employed. One method which has not been used in this area of study is the unfolding model. The purpose of this study is to analyze the Coopersmith Self-Esteem Inventory (SEI) using the Generalized Graded Unfolding Method (GGUM; Roberts, 2000; Roberts, Donoghue, & Laughlin, 2000). Unfolding methods provide valuable information regarding the completeness, or incompleteness, of the scale in question. Information is provided as to a scale's ability to successfully discriminate between individuals. In order to continue improving the quality of self-esteem research, the instruments used in that research must continually be re-evaluated. An unfolding analysis may provide additional insight into how well the SEI is measuring the construct of self-esteem.

Hypotheses

1) Since the original items for Coopersmith Self-Esteem Inventory (SEI) were chosen based on their placement into the two distinct groups of high and low self-esteem, it is hypothesized that the items will be found to be located in two distinct groups, one at either end of the dimension.

2) It is hypothesized that this arrangement of items along the continuum will result in a gap in the scale; that is, there will be a lack of items representing the area between the two groups.

3) It is hypothesized that the results will identify respondents who are positioned along the dimension in that area, between the two groups of items, for which there are no representative items.

4) It is hypothesized that individuals with significantly different GGUM values will share SEI scale values.

5 a) It is hypothesized that the SEI corresponds to the unfolding model. As such, they should be highly correlated, if the SEI scale scores accurately represent individuals along the represented continuum.

b) It is hypothesized that a low correlation exists, $r < .80$, between the SEI scale scores and the GGUM values for individuals.

Method

Data

Data was obtained from a previously approved study (Butler, 1993), which utilized the Adult Form of the Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1989). The use of data was submitted to the Institutional Review Board (IRB) of Austin Peay State University and approved (Appendix A). The SEI Adult Form presents 25 statements to which participants respond by indicating whether or not the statements are "Like Me," or "Not Like Me" . To receive a total score, each response made in the appropriate direction is awarded 4 points. The scale is hand scored with the help of a scoring key.

The archival data was obtained from 678 adult students attending "two southeastern four-year universities." For this present study, only 125-150 individual inventories were required. Therefore, a graduate student randomly pulled out data sets from the stored data. The second side of the SEI was then copied and provided for this study. This second side of the inventory provides the participant responses but no identifying data. Demographic information was collected and provided in summary form by the same student. The researcher received data from 152 participants. Four of the participants had not responded to all the items and were therefore discarded. Data was entered into the unfolding program and analyzed.

Of the remaining 148 participants, the program identified 12 ill-fitting participants. These were discarded resulting in a final pool of 136 participants: 83 female, 45 male, and 8 of unknown gender. The resulting demographics are as follows: 110 Caucasian (70

female, 35 male, 5 unknown gender), 8 African American (4 female, 3 male, 1 unknown gender), 6 Asian (4 female, 2 male), 4 Hispanic (2 female, 1 male, 1 unknown gender), 2 Native American (1 female, 1 male), 1 female Phillipino, and 4 of unknown ethnicity (1 female, 3 male).

Unfolding Model

The unfolding model used in this study was the Generalized Graded Unfolding Model (GGUM) provided in the GGUM2000 system software package (Roberts, 2000; Roberts, Donoghue, & Laughlin, 2000). The GGUM2000 software package is provided free of charge as a downloadable software package from the Internet (Roberts, 2000). This particular unfolding model is able to unfold either binary or graded responses. It was, therefore, used in this study so that results from this study might later be compared to results obtained in a proposed future study involving scales with graded response formats.

Procedure

After the data had been obtained, the responses were scored and the individual item responses were unfolded using the GGUM program. For program command file configuration, recommended and default values provided in the GGUM software manual were used (provided as part of the downloaded program package). Ill-fitting individuals, as determined by the GGUM program, were discarded and the remaining data re-run. This resulted in four runs of the model before no more individuals were identified as ill-fitting. Item and individual locations were plotted. Since the SEI fit the unfolding model, the unfolded individual location values were correlated to the SEI total scores.

Chapter IV

Results

Item location values (δ) were generated and can be found in Table 1 (Appendix B). These values were then plotted on a number line to demonstrate how the items relate to one another along the theoretical continuum (Figure 1, Appendix C). Supporting Hypothesis 1, items are found to be located into two groups, positive and negative. The negative items are more closely grouped than the positive items. There are approximately twice as many negative items as there are positive items with 17 negative items ranging in positions from -6.185 to -1.724 and only 8 positive items in positions ranging from .378 to 4.088. There is a portion of the continuum unrepresented in the midst of the positive items. Supporting Hypothesis 2, there is a portion of the continuum unrepresented between the groupings of positive and negative items.

Individual location values (θ) were generated and are listed in Table 2 (Appendix D). These values are arranged by participant, by Coopersmith Self-Esteem Inventory Score (SEI; 1957, 1967, 1998), and by location (θ). The range of individual locations extends from -2.306 to 2.513. This range is indicated in Figure 1 (Appendix C) showing how individual scores were located relative to item locations. The range of the continuum in which individuals were located was under represented, containing only 3 items. Hypothesis 3 was therefore supported as the majority of participants were located where no items were found.

There were not enough individuals sharing a common SEI score to perform a test of significance, therefore Hypothesis 4 is could not be supported. However when looking at the third column in Table 2 (Ordered by location, Appendix D), some weaknesses of the SEI become obvious. Most noticeably, the three individuals with SEI scores of 100 were located lower on the continuum than several individuals with SEI scores of 92 and 96. The correlation between SEI scores and individual locations is $r = .95$. Since there is not a one to one relationship, it would be expected that groupings of SEI scores would overlap each other by item location as is seen. Yet, some of this overlap appears to be excessive. For example, at item location -0.918 we find an individual with a SEI score of 60. There are 14 individuals located along the continuum above this individual who have lower scores, one being as low as 40. Additionally, there are two individuals with a SEI score of 80 (locations -0.149 and 0.320) with SEI scores between them that run as low as 72 and as high as 84.

Graphs of item expected and observed responses were generated and are ordered by item location (Figures 2a-2y, Appendix E). The correlation between observed and expected scores is also provided with each graph. The non-monotonic curve representative of an unfolding model can be clearly seen in Figures 2i, 2k, 2l, 2p, 2q, and 2y. It can also be seen that the curves do change direction as they move along the scale and actually fold over at it 5 (Figure 2r). Hypothesis 5a was supported, the SEI does follow the unfolding model. However, Hypothesis 5b was not supported as a correlation coefficient of $r = .95$ was obtained between SEI scores and individual location scores.

The higher the correlation between observed and expected scores the better the

particular item is at discriminating between individuals. Items 16, 17, and 2 are the poorest discriminators with correlation coefficients of r = .70, .78, and .79 (Figures 2c, 2g, and 2h; Appendix E). The rest of the items produced correlation coefficients of r = .80 and higher with 8 of the items having coefficients equal to or greater than r = .95.

Chapter V

Discussion

Since the early 1960s, many researchers have pointed out weaknesses in self-concept measures, and have called for continued validation efforts (Bryne, 1983; Crowne & Stephens, 1961; Demo, 1985; Gecas, 1982; Shavelson, Hubner, & Stanton, 1976; Wylie, 1961, 1974, 1979). Due to the inconclusiveness of past efforts, it has been suggested that newer methods of analysis be employed. One method which has not been used in this area of study is the unfolding model. This study has used such a model, the GGUM 2000 (Roberts 2000; Roberts, Donoghue, & Laughlin, 2000), to evaluate the adult version of the Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1959, 1967, 1989), one of the most popular and most used self-esteem measures (Johnson, Redfield, Miller, & Simpson, 1983; Lawton, Fergusson, & Horwood, 1989; Myhill & Lorr, 1978; Roberson & Miller, 1986).

The SEI was found to conform to the unfolding model and the correlation between SEI scores and individual locations was high, $r = .95$ (supporting Hypothesis 5a but not supporting Hypothesis 5b). The high correlation suggests that the SEI scale scores are a good indicator of how individuals relate to each other in regard to self-esteem. However, Roberts (Personal Communication, January 12, 2001) suggested that a high correlation only indicates that the two scales function similarly and that "systematic discrepancies" can still exist at "the extreme portions of the latent continuum." Indeed, problems were found, particularly at the high end of the scale, that suggest that the SEI may not be accurately

representing individual location.

Consistent with Hypothesis 1, items were found grouped into two distinct groups (Figure 1, Appendix C), those representing high and low self-esteem. This was expected since the original items were selected based on fitting into one of these two groups (Coopersmith, 1959, 1967). It also suggests that when using factor analysis with this measure, at least two factors should be found. Consistent with Hypothesis 2 and 3, the portion of the continuum where individual locations are found, a range between the groupings of positive and negative items, is relatively unrepresented with most respondents located where no items are present. This is a problem with scales of this nature (Andrich & Styles, 1998) and can result in scale scores that do not accurately represent the continuum being assessed. However, the ability of the items to discriminate is key and the better they discriminate, the less the under represented range is a factor (Roberts, Personal Communication, January 12, 2001; Roberts, Donoghue, & Laughlin, 2000). The best case scenario would be items with good discrimination that are evenly spaced along the continuum (Roberts 1996, 1998; Roberts & Laughlin, 1996a, 1996b).

In this study we found only three items with questionable ability to discriminate, items 2, 16, and 17 (Figures 2h, 2c, and 2g respectively, Appendix E). These items had correlation coefficients lower than $r = .80$, all others were greater with 8 having coefficients of $r = .95$ or greater. This would suggest that the items on the SEI should do a good job of discriminating between individuals and that individuals with the same SEI score should share similar locations. Hypothesis 4 suggested that individuals with the same SEI score would have significantly different positions along the continuum, particularly in

the portion under represented by items. Unfortunately, there were not enough individuals with the same SEI score to perform a test of significance on their locations and this hypothesis could not be supported. However as indicated in the results, some interesting discrepancies are found when SEI scores and individual locations are examined. In particular, the three individuals with SEI scores of 100 were located lower on the continuum than individuals with scores of 92 and 96 (Table 2, Appendix D).

If the items are good discriminators, then why should we find these results? Perhaps the answer lies in how closely located many of the items are to each other and in the fact that the higher end of the scale is not well represented, not only in number but in range. Notice that there are twice as many negative items as positive items and that the negative items range down to -6.185 while the positive items only range up to 4.088 (Figure 1, Appendix C). This results in an unbalanced scale. Item Response Theory suggests that an individual's actual location, or ideal point, along a theoretical continuum is determined by how much he or she agrees with an item (Coombs, 1964, Roberts, 1996, 1998; Roberts & Laughlin 1996a, 1996b). And with bipolar scales such as the SEI, it is the choice between pairs of items (based on level of agreement or disagreement with each item) that determine a person's ideal point location. Since the SEI does not provide an even distribution of items on either side of the continuum's midpoint, both in number and in range, the scale should have difficulty in accurately determining an individual's level of self-esteem, particularly at the high end of the scale. It is this researcher's opinion that if there had been a more equal number of positive items ranging up to around location 6.00, the individuals with scores of 100 would have been pulled out from among the other

scores to a higher position or assigned a lower scale score. In addition, this would likely pull all individual locations out toward the positive end of the scale to some extent (the degree to which any location would be made more positive would vary depending upon level of agreement with negative items), providing better discrimination among all individuals and making the SEI scores more meaningful.

Conclusion

The Adult Version of the Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1959, 1967, 1989) fits the unfolding method, making the method an ideal way to evaluate it. Although a high correlation exists between SEI scores and individual locations on the continuum, some problems were found. The items on the SEI do not appear to do a good job of representing the continuum addressed by the scale. A large portion of the theoretical continuum, the portion wherein individual locations were assigned, was under represented by the SEI items. Many of the negative items were located closely together, and although individual items were found to do a good job of discriminating between individuals, their usefulness in discriminating between individuals must be questioned. There were twice as many negative items (those representing low self-esteem) as there were positive items (those representing high self-esteem) and negative items covered a greater range than positive items, questioning the ability of the scale to accurately locate individuals, particularly those found at the high end of the continuum. Individuals with SEI scores of 100 were located on the continuum lower than individuals with scores of 92 and 96. As such studies involving the SEI may have drawn erroneous conclusions, particularly those focusing on high self-esteem. However before drawing conclusions, some limitations of this study must be noted.

One, the SEI is a self-report measure. It is impossible to determine how invested the participants were when responding to items or to what extent they may have faked good in their responses. Two, although the unfolding method has been around for

approximately four decades, the programs that now make it a useable method are "relatively new technology" (Roberts, Personal Communication, April 18, 2000). As such, any conclusions drawn from their use must be taken as tentative. Three, although the GGUM2000 (Roberts 2000, Roberts, Donoghue, & Laughlin, 2000) has been determined to provide accurate results with as few as 100 participants, it would have been better to have had a larger participant pool. This would have allowed testing for significant differences in individual locations associated with identical SEI scores, providing additional insight into how well the SEI scores discriminated between participants. And for a better demographic representation would have been desirable as the sample was largely Caucasian females.

With these caveats in mind, it does appear that there are some limitations to the widely accepted SEI and, perhaps, with other widely accepted measures of self-esteem that have been created in similar fashion such as the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Based on this study, one can not determine the usefulness or validity of the SEI, but one can justifiably question it. This then brings into question the validity of past self-esteem research, particularly research focused on high self-esteem. It would be interesting to use the unfolding method to design a new self-esteem measure. This would allow the selection of items that better represent the continuum in question and theoretically provide a better measure. It would then be possible to replicate past studies and, using the individual location values, reassess the findings.

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Austin Peay State University
Institutional Review Board

May 1, 2002

William Strasshofer, Jr.
c/o Dr. LuAnnette Butler
Psychology
APSU Box 4537

RE: Your application dated April 1, 2002 regarding study number 02-075: Unfolding the Coopersmith SEI: A Validity Study (Austin Peay State University)

Dear Mr. Strasshofer, Jr.:

Thank you for your recent submission. We appreciate your cooperation with the human research review process. I have reviewed your request for expedited approval of the new study listed above. This type of study qualifies for expedited review under FDA and DHHS (OHRP) regulations.

Congratulations! This is to confirm that I have approved your application through original submission. The Informed Consent Form is waived. This approval is subject to APSU Policies and Procedures governing human subjects research. These policies can be viewed at: www2apsu.edu/www/computer/policy/2002.htm. The full APIRB will still review this protocol and reserves the right to withdraw expedited approval if unresolved issues are raised during their review.

You are granted permission to conduct your study as described in your application effective immediately. The study is subject to continuing review on or before April 30, 2003, unless closed before that date. Enclosed please find the forms to report when your study has been completed and to request an annual review of a continuing study. Please submit the appropriate form prior to April 30, 2003.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Lou Beasley (221-6380; fax 221-6382; email: beasleyl@apsu.edu) if you have any questions or require further information.

Again, thank you for your cooperation with the APIRB and the human research review process. Best wishes for a successful study.

Sincerely,

Lou M. Beasley

Dr. Lou M. Beasley
Chair, Austin Peay Institutional Review Board

APPENDIX B

Table 1

Item locations by item and by location (δ).

Ordered by Item		Ordered by Location	
Item	δ	Item	δ
1	4.088	25	-6.185
2	-4.085	22	-6.036
3	-2.311	16	-5.871
4	0.892	10	-5.357
5	0.378	24	-5.126
6	-4.075	11	-4.276
7	-3.201	17	-4.113
8	2.680	2	-4.085
9	3.319	6	-4.075
10	-5.357	15	-3.953
11	-4.276	23	-3.455
12	-3.391	12	-3.391
13	-1.724	7	-3.201
14	1.089	18	-3.110
15	-3.953	21	-2.877
16	-5.871	3	-2.311
17	-4.113	13	-1.724
18	-3.110	5	0.378
19	2.716	4	0.892
20	2.908	14	1.089
21	-2.877	8	2.680
22	-6.036	19	2.716
23	-3.455	20	2.908
24	-5.126	9	3.319
25	-6.185	1	4.088

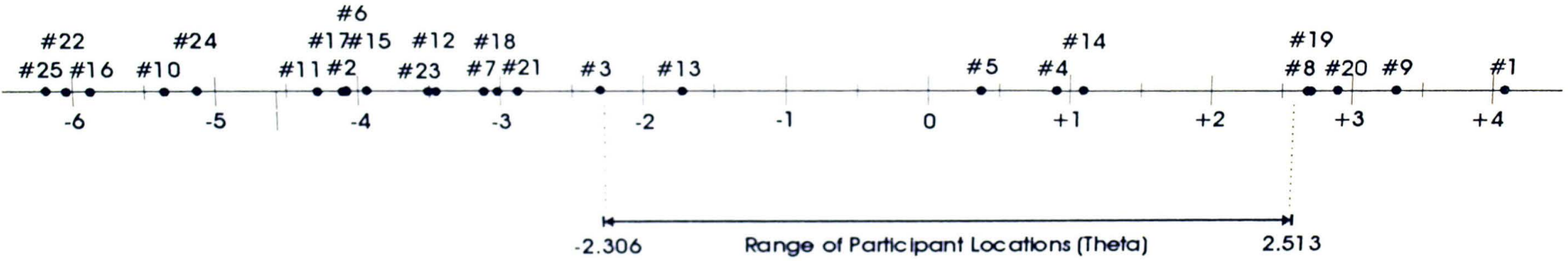


Figure 1. Item locations along the theoretical continuum underlying the Coopersmith Self-Esteem Inventory. The range of the continuum over which participant locations were located is also indicated. For the numerical location for each of the items above see Table 1, page 48.

APPENDIX D

Table 2

Individual locations by Participant (P), SEI score, and GGUM values (θ).

Ordered by Participant			Ordered by SEI Score			Ordered by Location		
P	SEI	θ	P	SEI	θ	P	SEI	θ
1	76	0.017	**40**	**8**	**-2.306**	40	8	-2.306
2	92	1.005	93	16	-2.103	79	24	-2.254
3	84	0.412	**125**	**24**	**-1.689**	93	16	-2.103
5	52	-0.825	**7**	**24**	**-1.738**	7	24	-1.738
6	76	-0.030	**79**	**24**	**-2.254**	125	24	-1.689
7	24	-1.738	129	28	-1.460	81	36	-1.516
8	68	-0.240	**147**	**36**	**-1.516**	23	40	-1.509
9	76	-0.063	**81**	**36**	**-1.504**	147	36	-1.504
10	72	-0.421	**119**	**36**	**-1.312**	129	28	-1.460
11	76	0.015	15	40	-1.509	92	44	-1.369
12	96	1.058	23	40	-1.254	119	36	-1.312
13	92	1.124	14	40	-1.248	15	40	-1.254
14	40	-1.248	59	40	-0.985	14	40	-1.248
15	40	-1.254	**70**	**44**	**-1.369**	70	44	-1.131
16	76	-0.136	**91**	**44**	**-1.131**	17	48	-1.079
17	48	-1.079	**92**	**44**	**-0.884**	105	52	-1.016
18	84	0.349	17	48	-1.079	131	48	-0.991
19	100	1.315	131	48	-0.991	59	40	-0.985
20	92	0.837	103	48	-0.983	132	48	-0.983
21	80	0.115	33	48	-0.896	138	52	-0.934
22	92	0.893	111	48	-0.892	**72**	**60**	**-0.918**
23	40	-1.509	132	48	-0.821	111	48	-0.896
24	76	0.116	**5**	**52**	**-1.016**	103	48	-0.892
25	96	1.164	**105**	**52**	**-0.934**	91	44	-0.884
26	52	-0.751	**26**	**52**	**-0.825**	5	52	-0.825
27	96	2.289	**61**	**52**	**-0.804**	33	48	-0.821
29	96	1.495	**138**	**52**	**-0.773**	61	52	-0.804
30	64	-0.678	**63**	**52**	**-0.751**	63	52	-0.773
31	72	-0.353	49	56	-0.765	113	56	-0.765
32	92	0.964	58	56	-0.746	26	52	-0.751
33	48	-0.821	107	56	-0.714	66	56	-0.746

APPENDIX D (continued)

Ordered by Participant			Ordered by SEI Score			Ordered by Location		
P	SEI	θ	P	SEI	θ	P	SEI	θ
34	84	0.484	115	56	-0.668	99	60	-0.727
35	80	-0.149	66	56	-0.648	58	56	-0.714
36	64	-0.488	113	56	-0.618	30	64	-0.678
37	72	-0.245	**99**	**60**	**-0.918**	107	56	-0.668
38	92	0.886	**86**	**60**	**-0.727**	120	60	-0.648
39	84	0.430	**72**	**60**	**-0.648**	49	56	-0.648
40	8	-2.306	**116**	**60**	**-0.627**	116	60	-0.627
41	64	-0.358	**120**	**60**	**-0.458**	115	56	-0.618
42	64	-0.559	41	64	-0.678	42	64	-0.559
43	68	-0.243	30	64	-0.559	136	64	-0.515
44	76	0.079	42	64	-0.515	36	64	-0.488
45	76	-0.194	36	64	-0.488	143	64	-0.469
46	96	2.289	127	64	-0.469	86	60	-0.458
47	76	-0.038	67	64	-0.429	127	64	-0.429
49	56	-0.648	136	64	-0.383	10	72	-0.421
50	72	-0.157	77	64	-0.358	108	72	-0.417
51	92	0.700	143	64	-0.356	67	64	-0.383
53	84	0.310	**8**	**68**	**-0.327**	41	64	-0.358
54	92	0.730	**43**	**68**	**-0.243**	77	64	-0.356
56	72	-0.082	**101**	**68**	**-0.240**	31	72	-0.353
57	84	0.599	56	72	-0.421	101	68	-0.327
58	56	-0.714	65	72	-0.417	114	76	-0.306
59	40	-0.985	108	72	-0.353	37	72	-0.245
60	76	-0.075	10	72	-0.245	43	68	-0.243
61	52	-0.804	31	72	-0.226	8	68	-0.240
62	92	2.513	50	72	-0.157	123	72	-0.226
63	52	-0.773	123	72	-0.082	45	76	-0.194
65	72	0.027	37	72	0.027	50	72	-0.157
66	56	-0.746	**16**	**76**	**-0.306**	**35**	**80**	**-0.149**
67	64	-0.383	**24**	**76**	**-0.194**	16	76	-0.136
68	100	1.315	**60**	**76**	**-0.136**	148	76	-0.104
69	88	0.683	**47**	**76**	**-0.104**	56	72	-0.082
70	44	-1.131	**144**	**76**	**-0.075**	60	76	-0.075
71	80	0.126	**96**	**76**	**-0.063**	9	76	-0.063
72	60	-0.918	**45**	**76**	**-0.038**	47	76	-0.038
73	76	0.020	**73**	**76**	**-0.030**	6	76	-0.030
74	84	0.507	**44**	**76**	**0.015**	117	80	0.010

APPENDIX D (continued)

Ordered by Participant

P	SEI	θ
75	80	0.162
76	80	0.169
77	64	-0.356
78	80	0.175
79	24	-2.254
80	96	1.121
81	36	-1.516
82	100	1.315
83	84	0.424
84	96	1.164
85	96	1.495
86	60	-0.458
87	88	0.725
88	96	1.121
89	88	0.464
90	92	0.822
91	44	-0.884
92	44	-1.369
93	16	-2.103
94	92	1.124
95	88	0.479
96	76	0.129
97	92	0.830
99	60	-0.727
100	92	0.737
101	68	-0.327
103	48	-0.892
104	92	0.795
105	52	-1.016
106	84	0.240
107	56	-0.668
108	72	-0.417
109	80	0.320
110	80	0.059
111	48	-0.896
112	76	0.036
113	56	-0.765

Ordered by SEI Score

P	SEI	θ
148	**76**	**0.017**
114	**76**	**0.020**
112	**76**	**0.036**
6	**76**	**0.039**
11	**76**	**0.079**
1	**76**	**0.116**
9	**76**	**0.129**
78	80	-0.149
126	80	0.010
76	80	0.059
117	80	0.109
35	80	0.115
110	80	0.126
109	80	0.162
21	80	0.169
71	80	0.175
75	80	0.320
83	**84**	**0.240**
3	**84**	**0.310**
34	**84**	**0.349**
39	**84**	**0.412**
18	**84**	**0.420**
57	**84**	**0.424**
53	**84**	**0.430**
74	**84**	**0.484**
128	**84**	**0.507**
106	**84**	**0.599**
89	88	0.464
95	88	0.479
87	88	0.683
118	88	0.725
69	88	0.733
104	**92**	**0.694**
94	**92**	**0.700**
90	**92**	**0.730**
97	**92**	**0.737**
2	**92**	**0.793**

Ordered by Location

P	SEI	θ
11	76	0.015
1	76	0.017
73	76	0.020
65	72	0.027
112	76	0.036
144	76	0.039
110	80	0.059
44	76	0.079
126	80	0.109
21	80	0.115
24	76	0.116
71	80	0.126
96	76	0.129
75	80	0.162
76	80	0.169
78	80	0.175
106	84	0.240
53	84	0.310
109	**80**	**0.320**
18	84	0.349
3	84	0.412
128	84	0.420
83	84	0.424
39	84	0.430
89	88	0.464
95	88	0.479
34	84	0.484
74	84	0.507
57	84	0.599
69	88	0.683
139	92	0.694
51	92	0.700
87	88	0.725
54	92	0.730
118	88	0.733
100	92	0.737
133	92	0.793

APPENDIX D (continued)

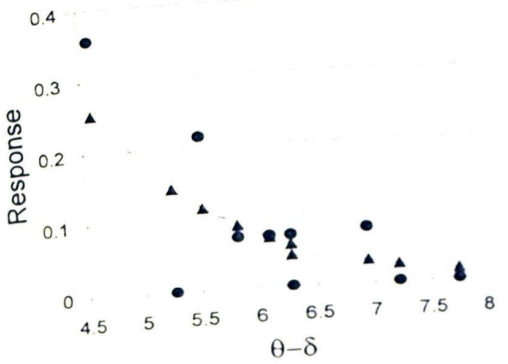
Ordered by Participant			Ordered by SEI Score			Ordered by Location		
P	SEI	θ	P	SEI	θ	P	SEI	θ
114	76	-0.306	**54**	**92**	**0.795**	104	92	0.795
115	56	-0.618	**100**	**92**	**0.822**	90	92	0.822
116	60	-0.627	**139**	**92**	**0.830**	97	92	0.830
117	80	0.010	**145**	**92**	**0.837**	20	92	0.837
118	88	0.733	**141**	**92**	**0.859**	141	92	0.859
119	36	-1.312	**62**	**92**	**0.886**	38	92	0.886
120	60	-0.648	**32**	**92**	**0.893**	22	92	0.893
123	72	-0.226	**51**	**92**	**0.964**	140	96	0.942
124	96	1.164	**13**	**92**	**1.005**	32	92	0.964
125	24	-1.689	**22**	**92**	**1.005**	145	92	1.005
126	80	0.109	**38**	**92**	**1.124**	2	92	1.005
127	64	-0.429	**20**	**92**	**1.124**	137	96	1.056
128	84	0.420	**134**	**92**	**1.669**	12	96	1.058
129	28	-1.460	**133**	**92**	**2.513**	80	96	1.121
130	96	1.164	46	96	0.942	88	96	1.121
131	48	-0.991	85	96	1.056	94	92	1.124
132	48	-0.983	25	96	1.058	13	92	1.124
133	92	0.793	27	96	1.121	135	96	1.156
134	92	1.669	80	96	1.121	25	96	1.164
135	96	1.156	135	96	1.156	130	96	1.164
136	64	-0.515	84	96	1.164	84	96	1.164
137	96	1.056	137	96	1.164	124	96	1.164
138	52	-0.934	130	96	1.164	**82**	**100**	**1.315**
139	92	0.694	88	96	1.164	**19**	**100**	**1.315**
140	96	0.942	140	96	1.495	**68**	**100**	**1.315**
141	92	0.859	29	96	1.495	29	96	1.495
143	64	-0.469	124	96	2.289	85	96	1.495
144	76	0.039	12	96	2.289	134	92	1.669
145	92	1.005	**19**	**100**	**1.315**	27	96	2.289
147	36	-1.504	**68**	**100**	**1.315**	46	96	2.289
148	76	-0.104	**82**	**100**	**1.315**	62	92	2.513

Appendix E

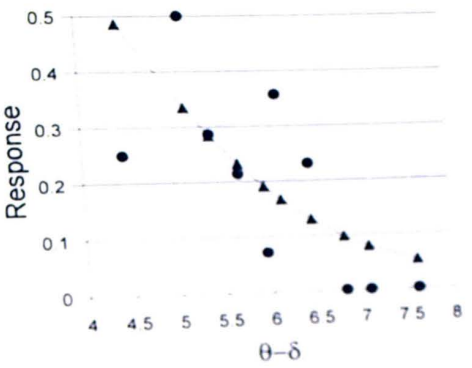
Figures 2a - 2f

Average Observed Item Responses (dots) and Average Expected Item Responses (triangles) as a Function of Mean Estimated $\theta_j - \delta_j$. Arranged by Item Location.

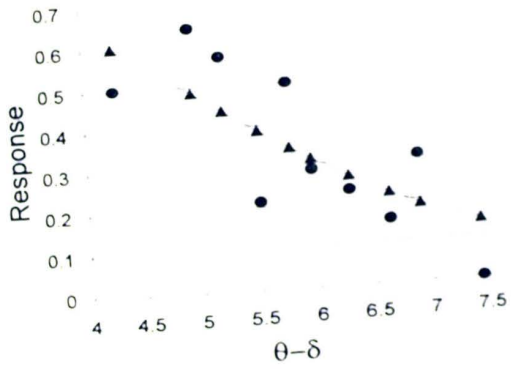
a. Item 25, $\delta = -6.185$, $r = .80$



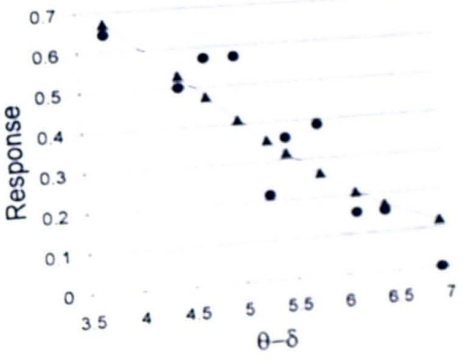
b. Item 22, $\delta = -6.036$, $r = .81$



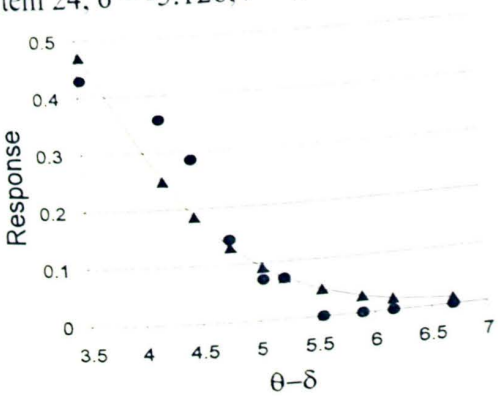
c. Item 16, $\delta = -5.871$, $r = .70$



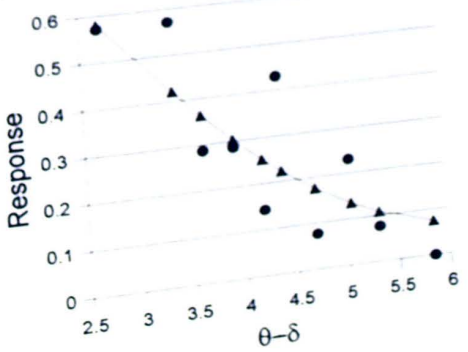
d. Item 10, $\delta = -5.357$, $r = .90$



e. Item 24, $\delta = -5.126$, $r = .95$



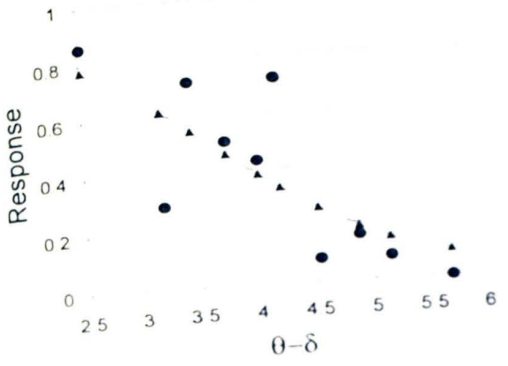
f. Item 11, $\delta = -4.276$, $r = .85$



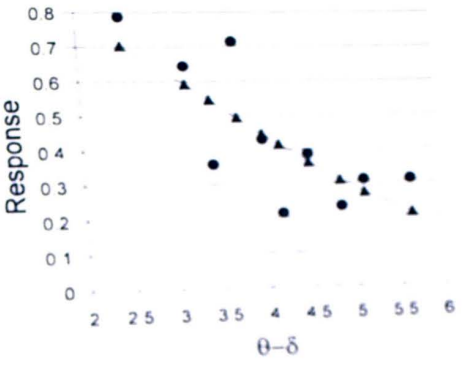
Figures 2g - 2l

Average Observed Item Responses (dots) and Average Expected Item Responses (triangles) as a Function of Mean Estimated $\theta_j - \delta_j$. Arranged by Item Location.

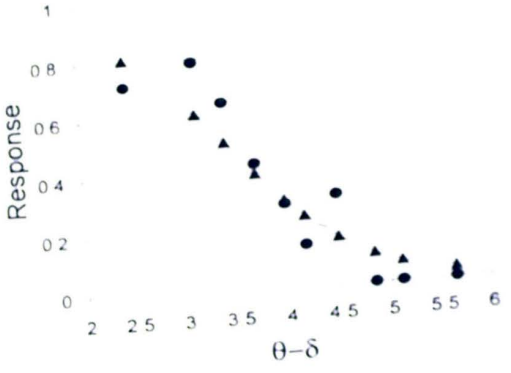
g. Item 17, $\delta = -4.113$, $r = .78$



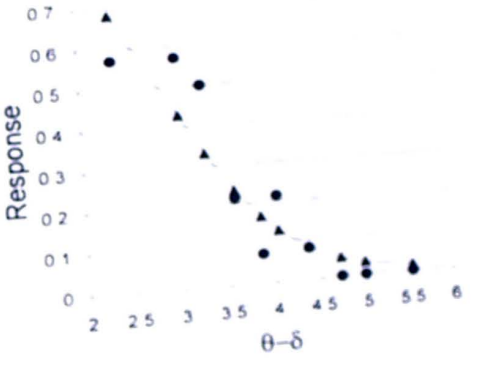
h. Item 2, $\delta = -4.085$, $r = .79$



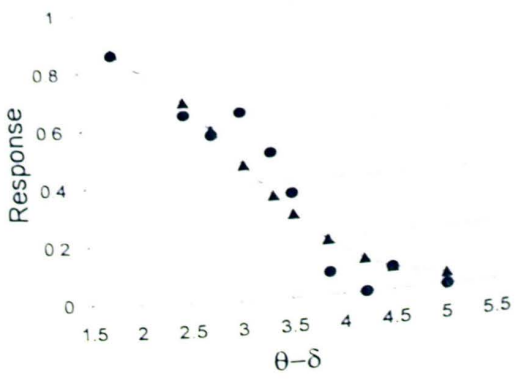
i. Item 6, $\delta = -4.075$, $r = .94$



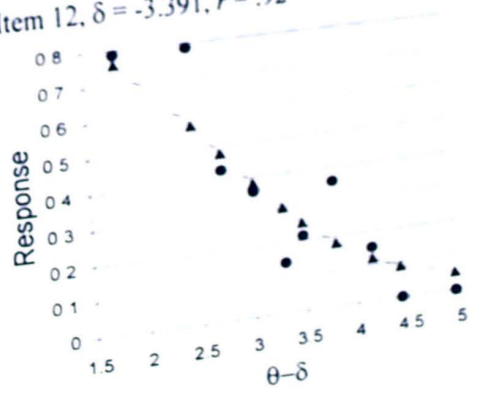
j. Item 15, $\delta = -3.953$, $r = .92$



k. Item 23, $\delta = -3.455$, $r = .95$



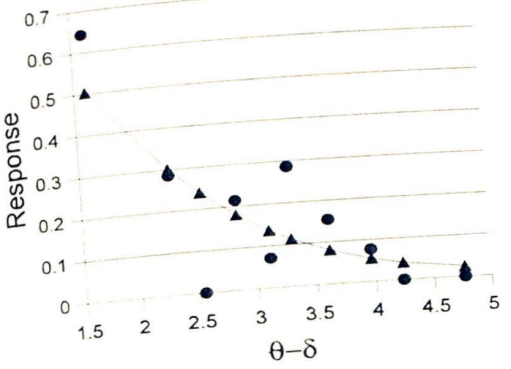
l. Item 12, $\delta = -3.391$, $r = .92$



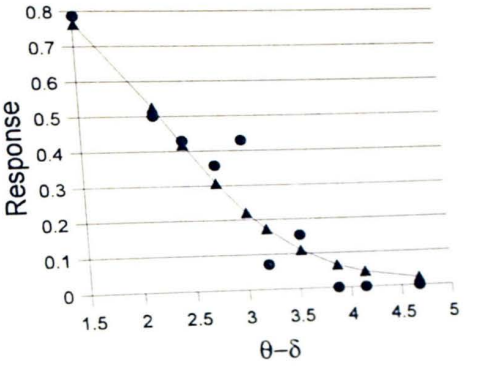
Figures 2m - 2r

Average Observed Item Responses (dots) and Average Expected Item Responses (triangles) as a Function of Mean Estimated $\theta_j - \delta_j$. Arranged by Item Location.

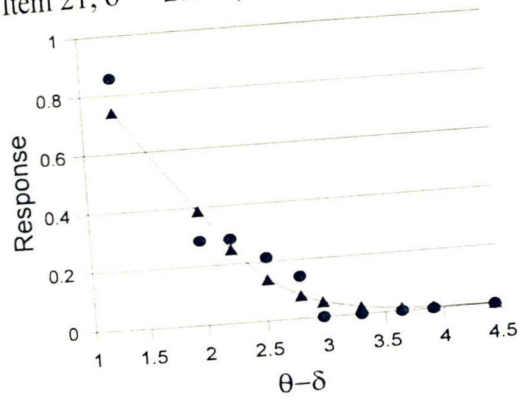
m. Item 7, $\delta = -3.201$, $r = .82$



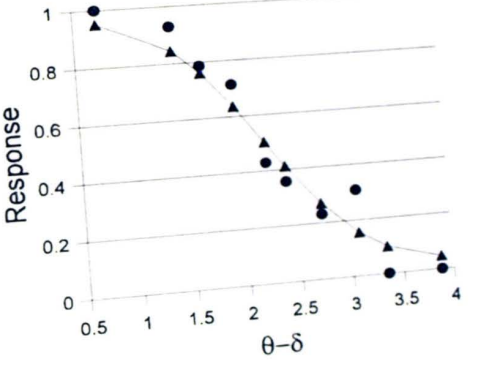
n. Item 18, $\delta = -3.11$, $r = .95$



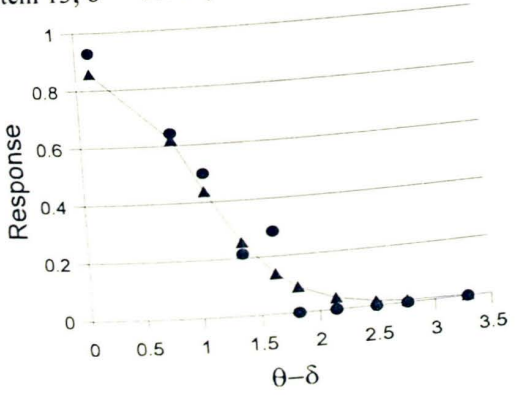
o. Item 21, $\delta = -2.877$, $r = .97$



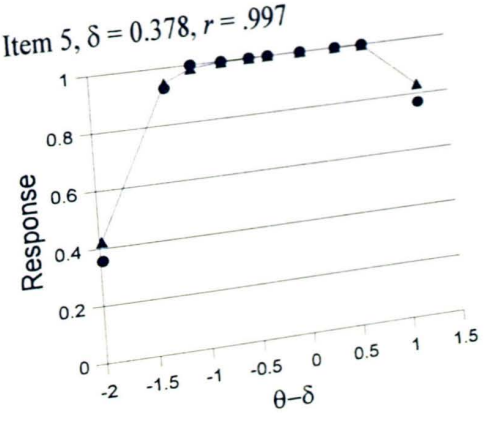
p. Item 3, $\delta = -2.311$, $r = .98$



q. Item 13, $\delta = -1.724$, $r = .98$



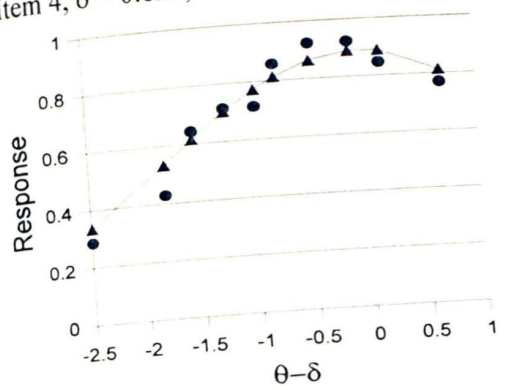
r. Item 5, $\delta = 0.378$, $r = .997$



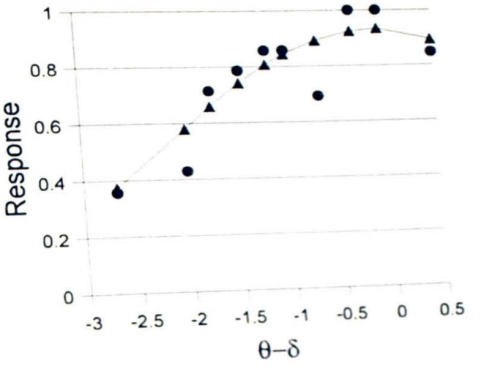
Figures 2s - 2x

Average Observed Item Responses (dots) and Average Expected Item Responses (triangles) as a Function of Mean Estimated $\theta_j - \delta_j$. Arranged by Item Location.

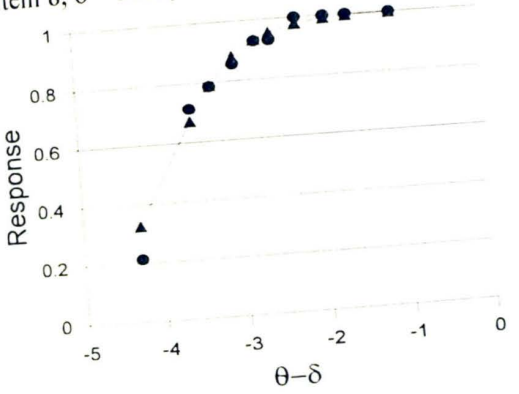
s. Item 4, $\delta = 0.892$, $r = .97$



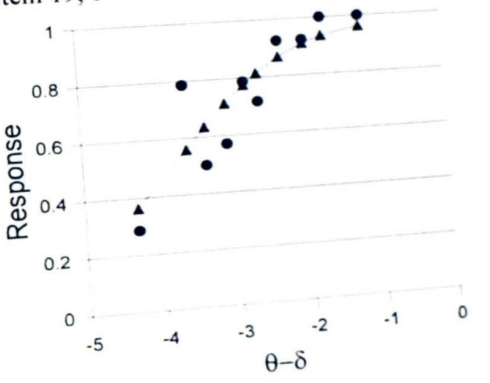
t. Item 14, $\delta = 1.089$, $r = .90$



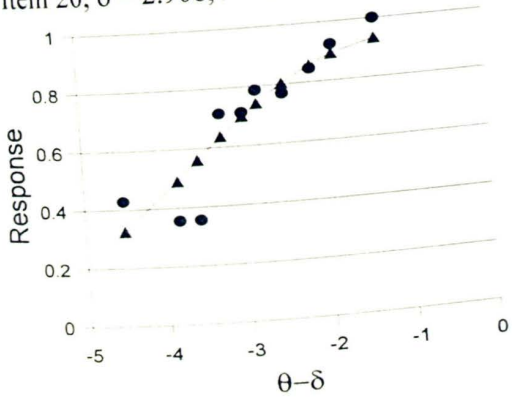
u. Item 8, $\delta = 2.68$, $r = .99$



v. Item 19, $\delta = 2.716$, $r = .88$



w. Item 20, $\delta = 2.908$, $r = .91$



x. Item 9, $\delta = 3.319$, $r = .80$

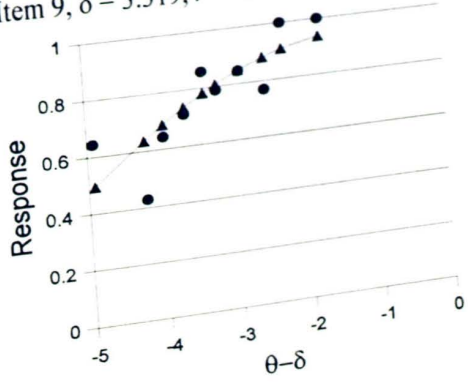
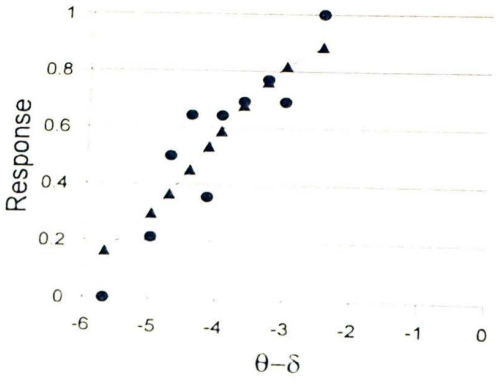


Figure 2 y

Average Observed Item Responses (dots) and Average Expected Item Responses (triangles) as a Function of Mean Estimated θ_j - δ_j. Arranged by Item Location.

y. Item 1, $\delta = 4.088$, $r = .90$



VITA

William E. Strasshofer, Jr. was born in Cleveland, Ohio on August 16, 1959. At age 5, he moved to Southwestern Michigan. There he attended Catholic and public schools until the middle of the 8th grade, when in the spring of 1973 he moved to Oak Park, Illinois where he completed the eighth grade and graduated from St. Giles Junior High. He graduate from Oak Park River Forest High School in May, 1977. He moved to Charlotte, Tennessee in April, 1982. In the fall of 1993, he entered Austin Peay State University to pursue a Bachelor of Science, major concentration in Psychology. He received his Bachelor of Science, major concentration in Psychology upon graduating Summa Cum Luade in December 1998. In the Spring of 1999, he entered the Graduate program at Austin Peay State University to pursue a Master of Science, major in Agency Counseling. His Agency Counseling Degree will be conferred in August, 2002. He is presently employed as a clinician for Family Guidance Training Institute, Inc. in Clarksville, Tennessee.