

THE INFLUENCE OF DEFENSIVENESS UPON SELF-REPORT
MEASURES OF ANXIETY

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Anxiety may be defined as "the experience of dread and foreboding based on some diffuse or specific expectation of harm rather than on an obvious external threat" (Sieber, O'Neil and Tobias, 1977, p.32). Anxiety levels may be inferred from general behaviour, physiological measures and/or self-report measures. As autonomic responses can rarely be voluntarily controlled, physiological measures avoid many of the problems inherent in subjective measures. However, they do tend to suffer from several weaknesses:

- a) Physiological measures are found to be unrelated, or only slightly related, to each other, to psychological indices of anxiety, or to the intensity of stress (Levitt, 1967, p.56; Morris and Liebert, 1970; Winter, Ferreira and Ransom, 1963).
- b) They are extremely labile and are easily affected by conditions of the experiment other than the experimental treatment itself.

The major weakness of the self-report measures stems from their subjective nature, leaving the scores subject to the confounding effect of social desirability. In particular, self-report anxiety measures may be effected by defensiveness. The term "defensiveness" is generally used to refer to one of two concepts:

- a) an unwillingness to admit to feelings of anxiety resulting in a lower report of anxiety than is actually experienced (delusion of others);
- b) "attempts to actually reduce the affective and physiological concomitants and behavioural effects of anxiety" (Houston, 1971, p.66), that is, the use of defensiveness as a cognitive coping strategy (self delusion).

Since defensiveness can be used as a denial of anxiety states, as in (a) above, it represents a source of noise and error in anxiety scales if not controlled for. A low score on an anxiety scale that does not control for defensiveness may therefore reflect a lack of or low level of anxiety or the deliberate denial of a medium-high anxiety.

Several studies have attempted to clarify the defensiveness-anxiety relationship or remove the resultant ambiguity associated with the self-report measures. Hill and Sarason (1966) reported that the negative correlation between test anxiety and achievement increased following adjustment of anxiety scores for defensiveness. In a similar study, the results of Boor and Schill (1967) lend support to the division of low anxious responders into two categories. Subjects scoring highly on the Taylor Manifest Anxiety Scale were found to be primarily low scorers on the Crowne Social Desirability Scale (low defensives) while only half of the low anxious subjects were non-defensive. In addition, a significant difference on digit symbol performance in favour of low anxious subjects was found only upon elimination of the defensive, low-anxious subjects.

The development of the Lie Scale (Sarason, Davidson, Lighthall, Waite and Ruebush, 1960) was an attempt to isolate low-anxious, high defensive responders. It consisted of eleven statements referring to feelings of anxiety or unhappiness. Mode of response was set in a yes/no format. The result was a scale itself of fairly obvious intent, although Eaton (1978, p.2) reported that "a moderate negative correlation between the TASC and the LSC has been found throughout the elementary school years; children who are highly defensive tend to report less anxiety".

Defensiveness, acting as a protective mechanism, would be expected to function more strongly when danger or threat is most apparent. Consequently, the more obvious an anxiety scale is, the higher the likelihood of it being confounded with defensiveness.

The present study attempted to determine the relative vulnerability of two anxiety scales to defensiveness. The scales under consideration were:

- a) the AACL: - a modification of the Zuckerman Affect Adjective Checklist (AAC). (Zuckerman, 1960; Docking, 1978).

The scale consisted of the 21 key anxiety words of the AAC embedded in 39 adjectives serving as suitable descriptors of any secondary/tertiary course (Docking, 1978).

Words were listed in alphabetical order. The subject's task is to underline any words which describe how he/she generally feels.

- b) the State-Trait Anxiety Inventory (STAI - A Trait); comprised of 20 statements which require the subject to indicate how he/she generally feels. Response is on a four point scale with the following categories: almost never, sometimes, often, almost always (Spielberger and Gorsuch, 1966).

From content examination of the relative intensity of elicitation of anxiety responses from the two scales it would seem that the AACL is less direct, less intense and consequently more subtle in approach than the STAI. Of the 60 words presented in the AACL, only 21 represent target words, that is, words contributing to anxiety scores. In the STAI, however, all 20 items are important. This difference in subtlety is also revealed upon direct inspection of the two scales. For example, a subject completing the AACL may underline the word "disappointment". The equivalent item on the STAI would be "I take disappointments so keenly that I can't put them out of my mind". The use of the first person pronoun "I" in the Spielberger items makes this scale more ego-involving and this is likely to evoke greater defensiveness.

These differences in scale subtlety suggest that more defensiveness would be aroused by the STAI than the AACL. To test this hypothesis it was necessary to prepare a measure (or measures) of defensiveness. For the purpose of this study, each anxiety scale was modified to form an associated defensiveness measure. This was done in order to maintain as closely as possible the relationship between subtlety of the scales and the effects of defensiveness upon each measure. To create an AACL defensiveness measure (AACLD) the preface of the AACL was changed from "read through the following list of words and underline those which describe how you generally feel" to "and underline those which never apply to you". The rating of the STAI was similarly modified changing from "almost, never, sometimes, often, almost always, to "never, sometimes, often, always" to produce an STAI defensiveness scale (STAI D).

AACLD was determined from the number of anxiety words underlined (never felt) and the STAI D score from the number of never and always responses to anxiety and non-anxiety items respectively. This approach reflects the approach taken with the Sarason lie scale.

It was expected that both the STAI and STAI D scales would be sensitive to both intra and inter-personal delusion while the AACL and AACLD scales would be sensitive to only intra-personal delusion. It was hypothesized that the STAI is less subtle than the AACL, and that:

1. The correlation between AACL and STAI would be moderate, the reduction being mainly due to respondents highly defensive on the STAI but not the AACL.
2. Defensiveness will be higher following STAI measures than following AACL measures.
3. The high AACL/low STAI group will be predominantly higher STAI defensives/low AACL defensives.

4. The low AACL/high STAI group will not be characterized by defensiveness.
5. The high AACL/high STAI group will be significantly lower than the remainder of the sample in defensiveness.

METHOD

Subjects The subjects were 47 students from a University Social Research Methods course consisting of an approximately equal proportion of males and females from five different faculties. Educational background varied, with students ranging from first year to graduate and mature age students.

Instruments

AACL:- modified AAC, previously validated against Spielberger and Gorsuch's (1966) STAI scales (Docking, 1978).
 AACLD:- as above with preface to scale changed to "underline those which never apply to you".
 STAI (A Trait):- Spielberger's Stait-Trait Anxiety Inventory (Trait Version).
 STAID:- as above, but rating scale changed to the following: never, sometimes, often, always.

Procedure

Subjects were administered the 4 scales in one of the following two orders of presentation:

- (a) STAI, STAID, AACL, AACLD (26 subjects)
- (b) AACL, AACLD, STAI, STAID (21 subjects)

Presentation order was changed with alternate subjects, the unequal numbers in the two groups a consequence of uneven distribution by two aids. Instructions were the same for all subjects: "These are two varieties of tests from the U.S.A. There is a slight variation in wording. Read each page as you come to it carefully. Answer each page as best you can. Don't turn back to compare answers. There is no time limit, but your first response is required, so please answer quickly."

Results

An intercorrelation analysis was performed on all scale scores. The correlation matrix is presented in Table 1. In line with hypothesis 1, a moderate correlation between AACL and STAI scores was found ($r=0.52$, $p < 0.0001$). A significant correlation was also found between AACL defensiveness and STAI defensiveness ($r = 0.31$, $p < 0.02$). (The relatively low correlation between the two measures of defensiveness was in keeping with expectations as the formats of the defensiveness measures were as close as possible to their associated measures of anxiety).

TABLE 1
 CORRELATION MATRIX FOR ALL SUBJECTS ON
 AACL, AACLD, STAI and STAID

	AACLD	STAI	STAID
AACL	-0.14	0.52***	-0.22
AACLD		-0.16	0.31*
STAI			-0.65***

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

A strong negative relationship may be seen between STAI and STAID ($r = -0.65$, $p < 0.0001$). The corresponding AACLD - AACLD correlation is nonsignificant suggesting that defensiveness does not significantly effect AACLD scores.

In order to more thoroughly investigate the effects of defensiveness upon anxiety scores, and in particular, to assess the differential effect upon the AACLD and STAI scales, the data was divided via a median split into high/low AACLD and high/low STAI scores. Defensiveness scores were then compared using t-tests across cells, rows and columns. The nature of the division and the means for each cell are presented in Table 2.

TABLE 2

DEFENSIVENESS SCORES FOR HIGH/LOW AACLD AND HIGH/LOW STAI SCORES

	Column Means	Grand Means
	AACLD = 2.6	AACLD = 1.9
	STAID = 6.5	STAID = 1.7
		AACLD = 2.3
		STAID = 4.2
(1) N = 8	(2) N = 14	
HIGH AACLD = 2.1	AACLD = 2.1	AACLD = 2.1
STAID = 7.9	STAID = 1.4	STAID = 3.7
<u>AACLD</u>		
(3) N = 15	(4) N = 9	
LOW AACLD = 2.9	AACLD = 1.6	AACLD = 2.4
STAID = 5.9	STAID = 2.2	STAID = 4.6
Low	High	
STAI		

Only variations in STAI were significantly related to defensiveness:

- (i) High AACLD/Low STAI respondents were significantly more defensive (as measured by STAID) than High AACLD/High STAI respondents ($p < 0.01$).
- (ii) Low STAI respondents were significantly more defensive (STAID) than high STAI respondents ($p < 0.0001$). (But Low AACLD respondents did not differ significantly from High AACLD respondents).
- (iii) Low AACLD/Low STAI respondents were significantly more defensive than High AACLD/High STAI respondents ($p < 0.002$). Variations in AACLD scores were not significantly related to AACLD scores (although the AACLD correlated significantly with STAID).

Hypothesis 3 is therefore supported by the data - the high AACLD/low STAI group consisted of high STAI defensives and low AACLD defensives. Hypotheses 4 and 5 were also supported. Cell 4 is not characterized by high defensiveness and cell 2 respondents were significantly lower on defensiveness than the remainder of the sample.

Effects of order of presentation upon anxiety and defensiveness scores were then examined. The following hypotheses, derived from hypothesis 2, were tested.

ORDER:	<u>STAI, STAI D, AACL, AACLD</u>		<u>AACL, AACLD, STAI F, STAI D</u>
(i)	AACLD	>	AACLD
(ii)	AACL	<	AACL
(iii)	STAI	=	STAI
(iv)	STAI D	=	STAI D

The results are presented in Table 3.

TABLE 3

EFFECTS OF ORDER OF PRESENTATION UPON ANXIETY AND DEFENSIVENESS SCORES

Means shown in brackets		Significance of Difference	
<u>STAI-AACL (N = 26)</u>		<u>AACL-STAI (N = 21)</u>	
(i) AACLD (2.54)	=	AACLD (1.95)	n.s.
(ii) AACL (6.31)	=	AACL (6.75)	n.s.
(iii) STAI (40.77)	>	STAI (37.43)	p < 0.05
(iv) STAI D (3.38)	<	STAI D (5.14)	p < 0.05

Contrary to the hypotheses suggested above, both AACL anxiety and AACL defensiveness measures were insensitive to order. This was not the case for the equivalent STAI measures. STAI trait anxiety decreased when presented second. Correspondingly, STAI D increased when administered in the second order of presentation.

The results do not support hypothesis 2. It was expected that due to the lack of subtlety of the STAI and resultant carry-over effects, AACLD scores would be greater when presented after the STAI measures. No significant differences were found between AACL (STAI-AACL) and AACL (AACL-STAI), although the difference was in the expected direction; with AACL first, AACL scores were slightly higher than when AACL was presented second.

The number of subjects in each cell and the effects of order of presentation upon cell numbers were examined. (Table 4). The susceptibility of STAI to order was again apparent. Chi-squared analysis of (i) numbers of subjects receiving STAI second and (ii) numbers receiving STAI first, revealed a marked difference in cell numbers only when STAI was administered first ($p < 0.005$).

TABLE 4

NUMBER OF SUBJECTS IN EACH HIGH/LOW AACL - HIGH/LOW STAI CELL

AACL	High	7 (AACL-STAI)	5 (AACL-STAI)
		1 (STAI-AACL)	9 (STAI -AACL)
Low		5 (AACL-STAI)	4 (AACL - STAI)
		10 (STAI-AACL)	5 (STAI - AACL)
		Low	High
		STAI	

Upon examination of table 4 it is evident that as in table 2, the discrepancy may be predominantly attributed to the AACL - first sample in cell 1, the high AACL/low STAI responders, i.e. high STAI D respondents.

DISCUSSION

The results clearly support the major hypothesis that the STAI stimulates more defensiveness than the AACL. Correlational analysis revealed only a moderate relationship between the two anxiety scales.

The relationship between STAI and STAID, and the lack of it in AACL - AACLD suggests that defensiveness is not an important component of AACL scores - while it appears to constitute a significant factor within STAI. Clearly different measures of defensiveness make generalizations difficult, but the significant correlation between the two defensiveness measures lends credence to this conclusion.

Comparisons between defensiveness scores of (high/low)(AACL/STAI) cells in general supported the predictions of the present study. Variations in AACL were not reflected in defensiveness scores although variations in STAI were. Subjects low on STAI and AACL scored high on both defensiveness measures. It may be postulated that this group represents subjects who are using defensiveness as a coping strategy and using it successfully. Consequently these subjects are in fact, low in anxiety.

Upon investigating the remaining cells it can be seen that this also occurs in cell 1, for STAID, but not for AACLD. Here AACL is high and as would be predicted, AACLD is low. However, while STAI is low, STAID is high. This suggests that for this group, defensiveness is not being used as a coping strategy, but rather reflects STAI only because the intent of STAI is more obvious. Thus, it would appear that the description of defensiveness as a coping strategy applies only when both AACL and STAI scores are low and AACLD and STAID scores are high. Subjects in cell 1 then may be said to represent the STAI "fakers" and as a result are a major potential source of error. The group scoring high on both anxiety scales and low on the measures of defensiveness appears to represent "pure" measures of anxiety, and anxiety scores from this group are not confounded by defensiveness.

The results of cell 4 are ambiguous. Here subjects are low AACL/low AACLD, but high STAI/low STAID - contradictory results. The fact that this group all scored low on the AACL and AACLD suggests that they are non-anxious. However, their high STAI/low STAID scores suggest the converse. It seems that the group reflects errors of measurement. Subjects are non-anxious and non-defensive and should score low on the STAI or high on AACL.

It was found that AACL was insensitive to order (although the trends were in the expected direction). While this results was not expected, it affirmed the greater robustness of AACL over STAI.

The reason why STAI scores were lower and STAID scores were higher with STAI second is largely due to the high-AACL/Low-STAI group (n=8), seven of whom completed the STAI second. On the basis of the STAI-first results, and the expected correlation between AACL and STAI one would expect one or two subjects in this cell. These individuals who do not fit the expected pattern are highly defensive on STAI but not on AACL, and their scores on the AACL would be a better reflection of their anxiety levels. Defensiveness aside, the sensitivity of the STAI to order of presentation suggests some weakness as a measure of Trait anxiety.

When order was taken into consideration the distribution of numbers in each cell again provided evidence for the sensitivity of the STAI to confounding variables compared with the robustness of the AACL.

While the use of different measures of defensiveness precludes a total generalization about the anxiety scales, the pattern of results obtained provide evidence for the notion that the subtlety of the measure and amount of defensiveness aroused are strongly related and that defensiveness is clearly an important factor to consider in the measurement of anxiety. Furthermore, the results suggest that the AACL is in general more robust than STAI - not only to defensiveness, but to various confounding variables such as order of presentation, the "test" situation and to "state" influence over trait anxiety.

It is not suggested that the AACL is perfect, but it would appear to be a better measure of anxiety than STAI. The confounding effect of defensiveness upon the STAI measure may in part explain the poor correlation of STAI with somatic and projective measures (Blankstein, 1976; Salter, Mourier and Triplett, 1976).

The results need replication for any further generalizations to be made. In particular, the present study should be repeated utilizing a single measure of defensiveness (ideally subtle itself) in an attempt to elicit the degree of defensiveness aroused by the STAI and the AACL. The two categories of defensiveness should be separated to discriminate between respondents within each category. The most important point to make is that defensiveness may obscure true anxiety scores and consequently obscure any relationship between anxiety and other variables of interest and that the confounding effects of defensiveness should be controlled.

REFERENCES

- Blankstein, K.R. Relationships between Spielberger trait anxiety and Lykken social and physical trait anxiety. Journal of Clinical Psychology, 1976, 32 (4), 781-782.
- Boor, M. and Schill, T. Digit symbol performance of subjects varying in anxiety and defensiveness. Journal of Consulting Psychology, 1967, 31, (6), 600-603.
- Docking, R.A. Anxiety, achievement and cognitive incongruence. (Unpublished) Murdoch University, 1978.
- Eaton, W.O. Cohorts effects in children's test anxiety and defensiveness. Presented at the annual convention of the American Education Research Association, Toronto, 1978.
- Hill, K.T. and Sarson, S.B. The relation of test anxiety and defensiveness to test and school performance over the elementary school years. Monographs of the Society for Research in Child Development, Serial No.104, 1966, 31 (Whole No.2)
- Houston, B.K. Anxiety, defensiveness and differential prediction of performance in stress and non-stress conditions. Journal of Personality and Social Psychology, 1971, 17 (1), 66-68.
- Levitt, E.E. The psychology of anxiety. New York: Bobbs-Merrill, 1967.
- Morris, L.W. and Liebert, R.M. Relationship of cognitive and emotional components of test anxiety to physiological arousal and academic performance. Journal of Consulting and Clinical Psychology, 1970, 35 (3), 332-337.
- Salter, C.A., Mourier, K.L. and Triplett, N.M. Multiple measurement of anxiety and its effects on complex verbal learning. Psychological Reports, 1976, 38, 691-694.
- Sarason, S.B., Davidson, K.S., Lighthall, E.F., Waite, R.R. and Ruebush, B.K. Anxiety in elementary school children. New York: Wiley, 1960.
- Sieber, J.E., O'Neil, H.F., and Tobias, S. Anxiety, Learning and Instruction. New York:Wiley, 1977.
- Spielberger, C.D. and Gorsuch, R.L. The development of the State-Trait Anxiety Inventory in C.D. Spielberger and R.L.Gorsuch (Eds.) Mediating processes in verbal conditioning. Final report to the National Institutes of Health, U.S. Public Health Service on Grants MH 7229 and HD947, 1966.
- Winter, W.D., Ferreira, A.J. and Ranson, R. Two measures of anxiety: A validation. Journal of Consulting Psychology, 1963, 27 (6), 520-524.
- Zuckerman, M. The development of an affect adjective checklist for the measurement of anxiety. Journal of Consulting Psychology, 1960, 24(5), 457-462.