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The effects of both state and trait anxiety and certain personality variables on performance in a complex motor task

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THE EFFECTS OF BOTH STATE AND TRAIT ANXIETY AND CERTAIN PERSONALITY VARIABLES ON PERFORMANCE IN A COMPLEX MOTOR TASK

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Chapter I

Introduction

The relationship of anxiety in both its state and trait manifestations to simple motor performance has been established in a number of studies (e.g. Spielberger, C. D., & Smith, S. H., 1966; Taylor, 1951; Spence, K. W., 1964). The present study is an attempt to extend these relationships to more complex motor performances, that is, to the level of a unitary group of motor habits such as is present in an athletic task. In doing this the present study utilizes not only direct assessments of both state and trait anxiety, but also assessment of certain personality traits which may be important in mediating the expression of anxiety and activation level.

Research in the area of anxiety indicates that a distinction must be made between anxiety as a personality trait that remains relatively stable over time and anxiety as a transitory state that fluctuates over time. Basically, the research has shown, among other things, persons high in trait anxiety are more strongly and frequently disposed to experience a state of anxiety. For a discussion of this literature, see Sarason (1960).

Numerous studies have been done in an attempt to establish a correlation between extreme trait anxiety scores and performance on a motor skill. A typical study was done by Vaught and Newmann (1966), in which they attempted to investigate the relationship between extreme scores on Taylor's Manifest Anxiety Scale (MAS) and performance in a motor steadiness

test. Also included in this study was the aspect of competition and its interaction with extreme MAS scores. There was an overall difference between high anxious and low anxious Ss with the high anxious Ss doing poorer than the low anxious Ss. But the most potent contribution to that difference was the competition factor. This is particularly important to note in relationship to the present study, because athletic performance is based on the fact that there must be competition in order to have any performance at all. The lack of a competition element in the experimental design might explain in part, the failure of such studies as Wiggins et al. (1962) and others who have been unable to predict from anxiety scales to performance in a number of similar tasks.

Research on the effects of state anxiety on performance may be typified by a study done by Spielberger, Southard, & Hodges (1966), where threat of electric shock on verbal conditioning was used to induce state anxiety. This study and others, conclude that the subjects' "cognitive appraisal" of an experimental situation is an important determinant of psychophysiological responses to stress. Boroczi (1966) states that the stimulus one is exposed to can be a source of increased anxiety "provided it has cue relevance for the individual." This cue relevance seems to be a function of the individual's past experience with the given stimulus material. It is also known that there are marked individual differences among subjects in their physiological response pattern under stress conditions (Lacey 1950; Lacey, Bateman & Van Lehn, 1953). For

these reasons it is felt that in order to accurately assess the variables involved in athletic performance it is necessary to account for measures of state anxiety as well as trait anxiety.

In addition to assessments of both state and trait anxiety it is felt that certain personality variables or traits might be important in mediating the expression of anxiety and activation level; specifically in an athletic performance, aggressiveness and competitiveness might be suspected to interact with anxiety. Leary's Interpersonal Checklist (ICL) is sensitive to these measures, and assesses basic traits on an orthogonal basis, i.e., dominance (DOM) and love (LOV). It seems logical that an athletic team which is dependent upon a willingness to compete and a desire to win, could be assessed correctly in terms of competitiveness and aggressiveness.

Chapter II

Method

Selection of Subjects

The subjects were the twelve members of the 1967-1968, University of the Pacific, varsity basketball team. The subjects were white caucasions between the ages of 19 and 21.

Test Selection and Administration

The MAS was chosen to assess trait anxiety, and personality traits were defined as scores on Leary's Interpersonal Checklist (ICL).

The MAS and ICL were administered to all subjects on October 19, 1967, at 3:00 p.m. All subjects were present and the following instructions were given:

ICL instruction. Here is a list of words and phrases which describe the way people behave in relation to one another. Your job will be to describe yourself as you generally think of yourself at the present time using these words and phrases. Place a mark through the number of each word or phrase which, in your opinion, describes you. For example, if you feel you are a person "able to give orders" place a mark through the number "1". If you feel you are not a person "able to give orders" do not mark the number "1". Then go on to consider each of the remaining words or phrases, marking those which describe you while leaving the others blank.

MAS instructions. Read each item carefully. If the

item is true as applies to you, place a +2 in the space provided at the left of the item number. If the item is partially true as applied to you, place a +1 in the space. If the item is false, place a -2, and if the item is partially false place a -1 in the space. Place a 0 in the space if you cannot answer the item. There are no right answers to the items; your own opinion as to how the item applies to you is the best response.

Certain research (Nelson and Langer 1963; 1965) indicates that by the time of the pre-game meal all players related feelings of anxiety. Other research (Wolpe, 1952a; Wolpe 1958) has shown that anxiety is capable of inhibiting the eating response. From a physiological outlook this can be understood by inspecting the functions of the sympathetic system of the central nervous system. Under anxiety producing situations the sympathetic activity causes the inhibiting of intestinal and gastric activity.

Thus, the amount of food intake by each player during the pre-game meal, when state anxiety would be at a high level, was used to assess state anxiety. This was done for 11 games, between the dates of January 3, 1968, and March 11, 1968. In light of the literature it was felt that players with high levels of state anxiety would eat less than a player with a relatively lower degree of state anxiety.

The pre-game meal itself afforded a tightly controlled situation which lent itself to assessment. The meal was

exactly four hours before a game, regardless of what time the game itself was being played. Also the amount of food was constant from meal to meal. Each pre-game meal consisted of: one 8 - 10 ounce steak, one baked potatoe (medium), one eight ounce glass of orange juice, one four ounce fruit cup, one helping of vegetables, and two pieces of toast with two pads of butter. Each item for each meal was checked as to whether it was completely eaten (one point), partially eaten (two points), or not eaten (three points). A total was kept for all players.

Dependent Variables:

The dependent variables used in this study were total minutes played, total points scored by each player, and a ranking by the coach. This criteria for success is employed by coaches and professional people in basketball and seems to be the most valid indicator of success.

Chapter III

Results and Discussion

In all cases the data was interpreted by the use of a Spearman r. The data was transformed from raw scores to ranked data and the dependent variable values were also ranked. This was done to reduce all the data to a point where it could be handled by one type of correlational coefficient. (See Table I)

The standard error of this sample is .67. It is important to note that because of the size of this sample, and the corresponding standard error, certain correlations do not appear to be meaningful. But the correlations are meaningful when looked at in respect to the small size of N and when looked at in terms of future research.

Trait anxiety, as measured by the MAS, correlates quite poorly to the performance variables at first glance. There is an adequate explanation for this, however. An examination of the distribution (see Figure 1) shows that subjects with scores at either extreme (low, high) tended to perform more poorly than those subjects with moderate scores--thus there is a tendency for extreme scores to dilute the correlation. Subjects with low degrees of trait anxiety do not seem to be sufficiently motivated to perform well, while subjects with high degrees of trait anxiety have their performance inhibited due to the high degree of their state anxiety response. To test this hypothesis, the players considered were limited to those who played regularly, and it was found that their scores fell in

Table I

Correlation of all independent variables with the performance criteria.
N equals 11.

	MAS	FOOD	DOM	LOV
Rank	.418	.846	-.536	+.464
Total Time	.232	.869	-.723	+.202
Total Points	.255	.897	-.750	+.273

Se = .67

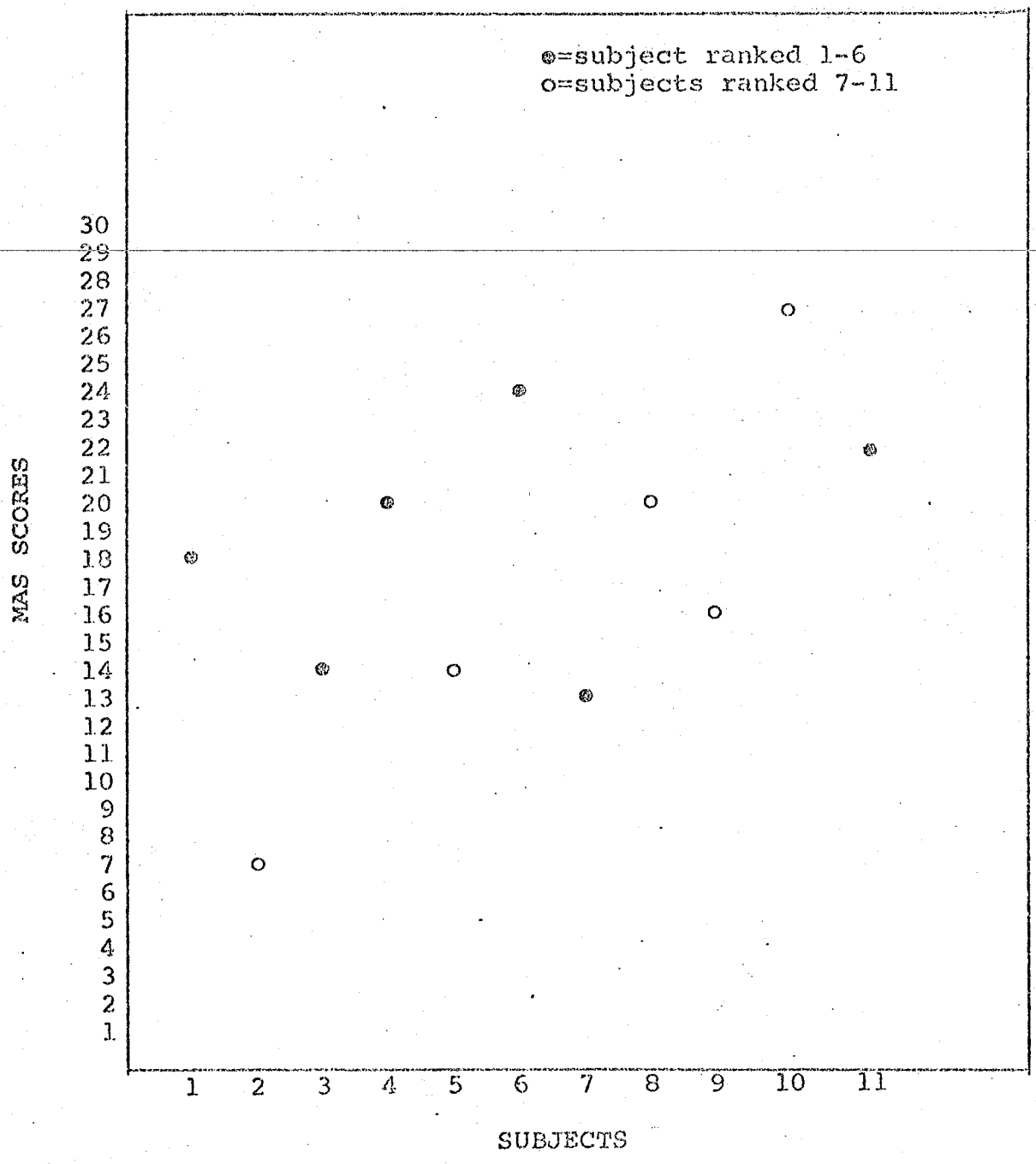

FIG. 1. DISTRIBUTION OF MAS SCORES

Table II

Mean scores of the independent variable

$\bar{X}$	1.55	3.98	17.55	167.48	274.27	192.64
	DOM	LOV	MAS	FOOD	TOTAL T.	TOTAL P.

the middle of the distribution of all scores obtained. These six subjects played a vast majority of the time (86%) while the players ranked 7-11 only played a small portion of the time (14%). It was found that these scores, which are representative of a moderate degree of trait anxiety, correlated much more highly with performance than the composite of all eleven scores. This tends to confirm the fact that in the moderate range of trait anxiety, subjects tend to perform better with high scores than with low ones. (See Table III)

State anxiety, as measured by food intake during the pre-game meal, correlates highly with the performance criteria. It is possible however, that this is a function of an intervening third variable which deals with whether or not the subject is told or knows that he is going to play or more specifically whether he will start, rather than a function of some innate mediator of success. That is, players who are playing long periods of time and scoring many points and ranked highly by the coach are much more likely to start, and to expect to play a lot more than other players and thus to be more apprehensive about the game situation.

From the basic hypothesis of this study and on an intuitive basis it would seem that high DOM scores and low LOV scores would be most indicative of success, but the results indicate just the opposite. As it stands now players with high DOM scores and low LOV scores are less likely to play and score points. One possible explanation for this deals with a slightly different interpretation of what the DOM and LOV stand

Table III

Correlation of MAS scores for subjects ranked 1-6 with the performance criteria
N equals 6

Rank	.486*
Total Time	.658*
Total Points	.543*

MAS

* Subjects ranked 1-6

Se = .77

for in terms of the items checked on the ICL.

On a broad basis DOM can be said to be indicative of a tendency to control in relation to others and LOV on the other hand indicates a general submissiveness or an ability to accept and utilize the opinions of others. From a coach's point of view then, those players who can be cohesive and free from unwanted internal controlling behavior will be selected to start more often than those players who are manipulative and controlling. On a team basis then it can be seen why DOM correlates negatively to the performance variables. The evidence indicates that players willing to accept and utilize the opinions of others are more likely to play longer and score more points. Since this study did not assess differences between coaching values it must be remembered that this may be a function of a unique value system of this particular coach. To control for this factor of unique coaching values, and to alleviate the problem of a small N, a study such as this one could be done with a football team. A football team is naturally divided into two groups, i.e., offensive players and defensive players, with each group coming under the direction of a unique coach or group of coaches. This grouping lends itself readily to manipulation and assessment. The same experimental design which is employed in the present study could be applied here with the addition of some measure which would assess the values of each groups particular coach. For example, an ICL could be given to each coach and his score could be compared to the scores of his players. It would be interesting to note what

type of player each coach recruits and plays in relation to his own personality makeup.

Chapter IV

Summary

A study was done to determine the effects of both state and trait anxiety, and certain personality variables on basketball performance. The results indicate that players with a moderate degree of trait anxiety tend to perform better than players of low and high degrees of trait anxiety. State anxiety correlates highly with the performance variables but these high correlations may be a result of an intervening third variable which deals with whether or not the subject knows that he is going to play or more specifically whether he will start. The personality variables which were defined as scores on the ICL correlate in opposite directions of the predicted hypothesis. A possible explanation of this takes into account a slightly different definition of DOM and LOV. Basically DOM can be said to be indicative of a general desire to control in relation to others and LOV to be indicative of a general submissiveness or an ability to accept and utilize the opinions of others. On a team basis it might be that players who can be cohesive and free from unwanted internal controlling behavior will be selected by the coach to start more often than those players who are manipulative and controlling. This gives rise to the idea that perhaps unique coaching values are important in understanding who plays and who does not play. A suggestion for future studies was given in which

the basic design of the present study was included with the addition of some variable which would assess individual coaches and their particular personality makeup for the purpose of comparing their profiles to the profiles of the players which they chose to play.

REFERENCES

References

Boroczi, G. The interaction of anxiety with situational and stimulus variables in influencing performance. Dissertation Abstracts, 1966, 26, 5545.

Lacey, J. I. Individual differences in somatic response pattern. J. comp. physiol. Psychol., 1950, 43, 338-350.

Lacey, J. I., Bateman, O., & Van Lehn, R. Autonomic response specificity. Psychosom. Med., 1953, 15, 8-21.

Nelson, D. O., & Langer, P. Getting to really know your players. Athletic Journal, 1963, 39, 88-93.

Nelson, D. O., & Langer, P. Comments on the athlete's playing performance and his Anxiety. Coach Athl., 1965, 28, 12-23.

Sarason, T. G. Empirical findings and theoretical problems in the use of anxiety scales. Psychol. Bull., 1960, 57, 403-415.

Spence, K. W. Anxiety (drive) level and performance in eyelid conditioning. Psychol. Bull., 1964, 61, 129-139.

Spielberger, C. D., & Smith, L. H. Anxiety (drive) stress, and serial-position effects in serial-verbal learning. J. exp. Psychol., 1966, 72, 589-595.

Spielberger, C. D., Southard, L.A., & Hodges, W. F. Effects of awareness and threat of shock on verbal conditioning. J. exp. Psychol., 1966, 73, 434-438.

Taylor, J. A. The relationship of anxiety to the conditioned eyelid response. J. exp. Psychol., 1951, 41, 81-92.

Vaught, G. M., & Newman, S. E. The effects of anxiety on motor-steadiness in competitive and noncompetitive conditions. Psychonom. Sci., 1966, 6, 519-520.

Wiggins, S. L., Brokaw, J. R., & Salzberg, H. C. Manifest anxiety and perceptual-motor steadiness. Percep. motor Skills, 1962, 15, 759-762.

Wolpe, J. Experimental neuroses as learned behavior. Brit. j. Psychol., 1952, 43, 243-268.

Wolpe, J. Psychotherapy by reciprocal inhibition. Stanford: Stanford University Press, 1958.