

STUDIES OF ANXIETY AND EDUCATIONAL ACHIEVEMENT

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There is conflicting evidence as to the nature of the relationship between anxiety and achievement, but the consensus seems to indicate a negative relationship.

Castaneda and his associates, using the children's form of the Taylor Manifest Anxiety Scale (CMAS), demonstrated the predicted negative relationship in a series of studies (Castaneda *et al.*, 1956a, 1956b; Palermo *et al.*, 1956; McCandless *et al.*, 1956). Morgan and others (1960) obtained a negative relationship between CMAS and achievement in girls aged eleven to twelve years. Hallworth (1961) found that CMAS yielded significantly higher scores for a secondary modern school sample as compared with a grammar school group. Carrier and others (1962) found that an orally administered version of the CMAS differentiated groups of bright, normal and educable mentally handicapped children aged ten to fourteen years. Frost (1965a), using the same instrument with boys and girls aged nine to eleven years, in Canada, obtained consistent negative relationships between anxiety and various standardized tests and teachers' marks. He also found that the children at a school with a working class background demonstrated a higher level of anxiety than those from a school with a middle class background.

Other investigators have failed to obtain significant relationships between CMAS and educational achievement variables. Crandall and others (1962), studying children aged six to eight years, found that the relationships were negative for boys but positive for girls, but none of the coefficients was significant. Similarly Morgan and others (1960) failed to obtain significant coefficients in a study of two groups of boys aged ten to eleven and eleven to twelve years. The same investigators (Morgan *et al.*, 1960) found a positive relationship between CMAS and achievement in a group of girls aged ten to eleven years.

TEST ANXIETY AND GENERAL ANXIETY

As we have noted before, Sarason and his associated differentiated test anxiety from general anxiety. After the publication of their "Test Anxiety Scale for Children" (TASC) (Sarason *et al.*, 1958), a series of studies followed which are discussed together with their theoretical background in the book *Anxiety in Elementary School Children* (Sarason *et al.*, 1960).

They reported that "the general hypothesis that children who are anxious by our measures should have greater difficulty with tests than their non-anxious peers appears to have received strong support. Performance of HA children was 'poorer' as measured by a variety of standards, e.g., in the figure drawing, Rorschach, and learning studies, and on the color-naming task. . . ." The correlation coefficients reported, however, are scarcely larger than those obtained in the CMAS studies, ranging from -0.17 to -0.31 (for TASC and achievement) and from -0.23 to -0.29 (for TASC and intelligence).

Further studies with the TASC and the GASC (their General Anxiety Scale for Children, which is not linked to the test situation) have been carried out by Cox. In one such study (Cox, 1960), he reported a curvilinear relationship between TASC and schoolmarks. In another (Cox, 1961), carried out with Canberra middle class school children, he found "that . . . boys and girls placed in 'inferior' educational streams obtain consistently higher mean test anxiety scores than those in 'superior' subgrades." In a third study (Cox, 1964), again with Canberra middle class school children, he found significant negative relationships between TASC and arithmetic examination marks, but non-significant positive relationships with reading.

In concluding his 1962 article, Cox claimed that there is a considerable amount of evidence, collected from large and diversified populations under different conditions, which is consistent with the notion that TASC is sensitive to "quite specific situational variables." On the other hand, he considered that GASC scores are independent of such situational variables but may be related to constitutional factors instead.

Cox's argument is vitiated by the fact that results do not always show a clear difference between GASC and TASC. In fact his own (1960) study shows a very similar relationship between examination marks and both GASC and TASC. Another unfortunate characteristic of Cox's research is the failure to separate girls from boys in his samples, when it is known that girls react differently from boys (cf. Phillips, 1962).

Biggs used GASC and TASC in conjunction with his own "Number Anxiety" scale in a study of third-class (nine to ten year old) junior school children. One conclusion of Biggs' complex study was that "highly formally taught boys and girls who were generally arousable (i.e., high scorers on GASC) and who were classified as being likely to have failed in learning (by their head teacher) obtained higher mean number anxiety scores than any of the other groups considered." More generally Biggs found that both the test and general anxiety scores were negatively related to mechanical arithmetic scores. This negative relationship was not found with

arithmetic concept scores. When he split the sample into "method of teaching" and intelligence groups, it was discovered that the relationship with general anxiety was (a) most pronouncedly negative in traditionally taught groups, and (b) positive or negative according to intelligence level "and therefore according to the extent to which learning was or was not likely to have been successful" (Biggs, 1962b). Biggs also tested the hypothesis that the relation of anxiety to performance is basically curvilinear. His data failed to support this hypothesis.

Biggs' results demonstrate that if test anxiety and general anxiety are different in some respects they also overlap to a large extent. In fact Sarason and his associates admit that "if the individual correlation coefficient of the TASC with mean achievement or IQ are compared to those of the GASC with mean achievement or IQ, the former are not significantly different from the latter." For any given homogeneous group of children "their performance in achievement or IQ group tests is not significantly more related to test anxiety than to general anxiety" (Sarason *et al.*, 1960).

That the content of an "anxiety" scale does make a difference was shown by Hallworth (1961). He found that Separation Anxiety (a scale derived from Lynn, 1955) gave higher scores for secondary modern school children as compared with grammar school children, whereas Self-Blame (derived from Bene, 1954) gave higher scores for the grammar school sample.

The foregoing discussion is with respect to school children, but studies have also been carried out with college students. Sarason (1957) reported positive relationships between his General Anxiety Scale (GAS) and Grade Point Average (GPA), but negative relationships between the latter and his Test Anxiety Scale (TAS). However, he also found that these negative correlations disappeared as you moved up the college years, i.e., the older (and brighter?) the student the less the correlation. Similarly, Alpert and Haber (1960) reported a study in which no significant relationship was found between MAS and GPA but a low negative one between TAS and GPA.

An attempt at refining the relationships between anxiety and achievement was made by Alpert (1958). He administered to male Stanford students, either in their classes or in small group experiments, the MAS, the Welsh Anxiety Index (WAI), the Freeman Anxiety Scale (FAS), the Mandler-Sarason Test Anxiety Scale (TAS) and a scale of his own, the Achievement Anxiety Scale (AAS). He studies the relationships of these scales to each other and to a measure of verbal aptitude and a set of academic performance indices including GPA, final examination, midterm examination and course

grades in the introductory psychology course. His results led him to conclude, inter alia,

(1) specific anxiety scales (e.g., TAS and AAS) and general anxiety scales (e.g., MAS, WAI, and FAS) are measuring to a significant extent something different from one another;

(2) the specific anxiety scales are better predictors of academic performance than are the general anxiety scales; and

(3) the specific anxiety scales, although more highly correlated with aptitude than the general anxiety scales, are, nevertheless, more often able to account for variance in academic performance other than that accounted for by a measure of aptitude.

It would seem, then, that there is conflicting evidence as to whether there are distinct variables termed "general" and "test" anxiety. The evidence seems more strongly in favour of such a distinction in the older age ranges; perhaps anxiety, like intelligence, differentiates with age. Even at the secondary school level, Hallworth's results show such a differentiation.

ANXIETY AND THE DIFFERENT SCHOOL SUBJECTS

There is evidence that anxiety may differentially affect school-work according to the subject concerned. We have seen that Biggs reported different results for mechanical as compared with conceptual arithmetic. Cox (1964) noted that TASC correlated negatively with arithmetic but positively with reading. Frost (1965a) also reported larger negative correlations between CMAS and arithmetic than between CMAS and reading, and the same writer (1956b) noted that a group of poor readers had below average scores on Cattell's second-order anxiety factor.

Lynn (1957), using a modified form of the MAS with secondary modern school children, found a positive association between anxiety and "better reading than arithmetic" (i.e., high reading-arithmetic ratios, the ratios used being derived by subtracting a standardized arithmetic score from a standardized reading score. Lynn suggested that poor reading may be the result of insufficient anxiety. His argument in favour of this proposition, apart from his own findings, is based on the following: Burt, in his *The Backward Child* (Burt, 1937), according to Lynn, said that anxious children are better at reading than arithmetic; D. M. Levy, according to Lynn, said that his group of maternally overprotected children (Lynn, 1943) were better at reading than arithmetic; psychopaths are better at arithmetic than reading (psychopaths being low in anxiety); and anxious obsessional neurotics are said by Himmelweit (1945) to be high on verbal tests relative to their (Progressive Matrices) intelligence.

Lynn's paper was severely criticized by Reed and Schonfield (1958). These authors showed that (a) Burt's unrepresed children

(a non-anxious group) also had reading scores higher than their arithmetic scores; (b) Burt reported an overall significant correlation between anxiety and general backwardness; (c) eleven out of Levy's twenty children were "primarily aggressive" rather than "anxious" and, of the remaining nine, only three had specific problems in arithmetic; (d) Wechsler (1941) claimed that the arithmetic of psychopaths is poor.

Lynn also claimed that the fact that girls were better than boys at reading might be due to their higher anxiety level. Reed and Scholfield counter-claimed that Lynn's data do not show a sex difference in anxiety nor any superiority by girls in reading.

The argument between Lynn on one hand and Reed and Schonfield on the other, was based on very shaky ground. Much of the evidence cited was tangential and/or based on work with adults. One of the few studies with juvenile, rather than adult, sociopaths (psychopaths), that of Frost and Frost (1962), shows that their WISC arithmetic scores are higher than their vocabulary scores (vocabulary is highly correlated with reading) and their verbal scores generally are low relative to their performance scores. But such evidence does not show that reading would be *positively* related to anxiety. Lynn's findings may be amply due to the fact that anxiety is *more strongly* related to *arithmetic* than it is to reading.

ANXIETY AND INTELLIGENCE

Warburton (1962), in reviewing Malpass and others' (1960) finding of no significant relationship between CMAS and IQ in three groups of retardates and normals, wrote that "this appears to be the general consensus of opinion in researches into the relationship between measured anxiety and intelligence at all levels." Warburton would appear to be mistaken as negative correlations were reported by Sarason (1959), Hafner and Kaplan (1959), and Phillips *et al.* (1960), Keller and Rowley (1962), Cox (1964) and Frost (1965a). While not all of these negative correlations were strictly significant, the consistency of the results leads one to suspect a small negative relationship. No doubt the magnitude of the correlation will vary with the content of the intelligence test.

A few investigations have used somewhat more complex designs. Ruebush (1960) found that highly anxious children in the low to middle intelligence range did better on tests requiring a cautious approach than children high on both anxiety (TASC) and intelligence (Otis Beta). Wrightsman (1962) studying the interaction of anxiety and two different conditions of testing, discovered that, when the test was seen as important to the subjects, highly anxious subjects score significantly lower than non-anxious subjects. When the test

was seen as relatively routine no significant relationships emerged. Feldhusen and Klausmeier (1962) found that the correlations between anxiety and achievement were negative for the low and average IQ groups but not for the superior group.

Spielberger and Katzenmeyer (1959), working with university students, reported a low negative relationship between MAS and GPA for their total sample but interesting differences in subsamples. When they divided their sample into the lower 20%, middle 60%, and upper 20% on aptitude (ACE) scores, they found that the correlations between MAS and GPA were -0.04 , -0.18 , and -0.05 respectively. They suggested that "college work appeared too difficult for the low students whose poor grades were unrelated to their MAS scores. High aptitude students tended to obtain good grades regardless of their anxiety level."

Broen(1959) concluded that "anxiety is a variable which because it has similar effects on intelligence test performance and achievement, aids in the prediction of achievement. Because of this, procedures for suppressing anxiety during intelligence testing are seen as decreasing the relationship between intelligence test performance and school achievement."

MODERATOR VARIABLES

We have discussed investigations that have shown how age, sex and intelligence play a part in determining the relationships between anxiety and achievement, but few, if any, studies other than those of Biggs (1962b) and Phillips (1962) have allowed for all of these factors in their design. The latter study was the only one to allow for the effect of social class.

Studying the relationships between anxiety (as measured by the CMAS) and educational achievement, Phillips obtained the following results: (1) subjects with low anxiety had higher achievement than subjects with high anxiety; (2) an increase in anxiety resulted in lower achievement for middle class subjects but had no appreciable effect on the achievement of lower class subjects; (3) an increase in anxiety resulted in an increase in the achievement of lower class males and a decrease in the achievement of lower class females; (4) an increase in anxiety resulted in a larger decrease in the achievement of middle class females than it did in middle class males.

Phillips concluded that (1) general anxiety affects teacher grades more than achievement tests, with the achievement of lower class males being less affected than the achievement of other adolescents; (2) whether anxiety is compatible or incompatible with school achievement tasks seems to depend upon social class; (3) since school achievement tasks are more ego-involving to middle class subjects and to females more than males (particularly in the lower class) the degree

to which anxiety interferes with school achievement should depend upon both the sex and social class of the subjects. "Taking into account these specific relationships, anxiety should interfere the least with the school achievement of lower class males, and this is what the overall findings of this study showed."

Clearly the above mentioned evidence makes it mandatory that an investigation should include age, sex, social class, and intelligence as variables, if the relationships between anxiety and achievement are to emerge satisfactorily.

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ABSTRACT

There is conflicting evidence as to the nature of the relation between anxiety and educational achievement in children but the consensus seems to indicate a negative relation.

Attempts have been made to distinguish test anxiety from general anxiety and to claim a stronger relation between the former and achievement than between the latter and achievement. The evidence for such a distinction seems stronger in the older age ranges (e.g., university students).

There is some evidence that there are different relations between anxiety and the different school subjects, specifically reading and arithmetic, such that the latter is more affected.

It seems clear that age, social class, sex and intelligence each play a part in determining the precise relationship between anxiety and achievement and that these factors should be included in any satisfactory study.

RESUMEN

Hay evidencia en conflicto en cuanto a la naturaleza de la relación entre la ansiedad y el logro educativo en los niños pero el consenso parece indicar una relación negativa.

Se ha tratado de diferenciar la ansiedad al examen de la ansiedad general y de sostener una relación más fuerte entre la primera y el logro, que entre la segunda y el logro. La evidencia para tal distinción parece más fuerte en los grupos de más edad (es decir, estudiantes universitarios).

Hay alguna evidencia que existen distintas relaciones entre la ansiedad y las diferentes materias escolares, específicamente la lectura y la aritmética, tal que esta última resulta más afectada.

Parece estar claro que la edad, la clase social, el sexo y la inteligencia, cada uno juega una parte en determinar la relación precisa entre la ansiedad y el logro y que estos factores deberían ser incluidos en cualquier estudio satisfactorio.

RESUMO

Existem dados contraditórios relativamente à natureza da relação entre ansiedade e aproveitamento escolar em crianças, mas o consenso parece indicar uma relação negativa.

Têm-se feito tentativas para distinguir entre a ansiedade produzida pela situação de teste a ansiedade geral, sugerindo-se uma relação menor entre esta última e aproveitamento, relativamente à primeira. A base para tal distinção parece mais evidente entre estudantes mais velhos (universitários, por exemplo).

Há base para a existência de relações diferentes entre ansiedade e as diferentes matérias escolares, especificamente leitura e aritmética, sendo esta última a mais afetada.

Parece claro que idade, classe social, sexo e inteligência, respectivamente, tomam parte na determinação da relação entre ansiedade e aproveitamento escolar e que estes fatores devem ser incluídos em estudos que pretendam ser adequados.