

PERSONALITY AND ATTAINMENT: AN APPLICATION OF PSYCHOLOGICAL PRINCIPLES TO EDUCATIONAL OBJECTIVES

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ABSTRACT

In education it is important for applied research systematically to apply and test current psychological theories. However oversimplification of a theory will generally lead to inappropriate hypotheses and hence to inconclusive or inconsistent results. In research on personality and academic attainment it has been common to derive hypotheses about the effect of neuroticism directly from an early Hullian formulation. Examples in terms of the academic behaviour of students are used to explain recent adaptations of this basic theory. In particular it is necessary to distinguish between "trait" and "state" anxiety and to incorporate allowances for the effect of previous habit systems. Strongly established habits will control the type of behaviour elicited by drive stimuli, such as imminent examinations.

Anxiety, even as a trait variable, can be seen as operating in opposite directions, facilitating or debilitating performance according to the nature of the individual and of the drive stimuli. In the progression from primary to higher education there will be a tendency for individuals whose high neuroticism adversely affects their performance to be eliminated; hence a positive correlation between achievement and neuroticism at this level might be anticipated.

While there is considerable complexity in the relationship between anxiety and achievement, it is clear that introversion is consistently linked with success in higher education. This high performance is probably due to the introvert's better study habits and his ability to become conditioned easily to the predominant academic mores. In addition the build-up of reactive inhibition in extraverts during lectures or prolonged periods of study is likely to lead to "avoidance symptoms" in time.

There seems to exist a good deal of agreement that personality is important, in addition to mental ability, in determining the academic success or failure of school children and students alike. Research evidence has produced a few generalizations which have been replicated sufficiently often to base some confidence in the conclusions reached, but correlations are not usually very high, and replication has not always been the rule. It is suggested here that closer attention to the theories worked out in the laboratory might lead to less simplistic studies in this area, and that theoretical predictions can be made in a much more detailed manner than has hitherto been customary. Attention is also drawn to the importance of studying the interaction of personality variables with other variables which may enter the prediction equation, and which are too often left out of account in empirical studies. It is

suggested that education as an applied science has not in the past made optimum use of psychological advances, either in theory or in practice, and that closer collaboration between theoretical psychologists and educationists might lead to considerable advances in this field.

Kurt Lewin used to maintain that "nothing is as practical as a good theory," and one might think that educational practice would embrace with some eagerness at least some of the good theories which experimental psychology had produced in recent years, and which might be thought to be relevant to education. Such an optimistic view would leave out of account the well-known experience of physical scientists that however good a theory might be, and however strongly supported, nevertheless its practical application requires a considerable amount of additional applied research. It is sometimes estimated that the time from the discovery of a new principle, or the enunciation of a new theory, to successful application may be as long as 50 years, and this is about the length of time which elapsed from Faraday's revolutionary theories in electricity to the use of electricity in street lighting; it needed the genius of Edison to make possible the practical application of these new principles. In psychology, it seems likely that a similar law obtains; new theories cannot be applied immediately to any practical purpose, without a lengthy period of applied research. It is this period of applied research that is so often missing, and its absence may account for the failure of education to be much influenced by psychological discoveries. Another reason may be that educationists often oversimplify the psychological theories they are interested in trying out, so that predictions are made without bearing in mind the full complexity of the theory in question; this inevitably leads to disconfirmation, and to inconclusive and inconsistent results. In this paper I wish to look at just one example of such a theory, and point out why the results of its application have, on the whole, been rather disappointing. I also wish to indicate ways in which better results may be obtained.

It is well known that attainment of educational objectives can be predicted quite well by measures of intellectual competence, even though these are by no means beyond criticism (Eysenck, 1967). It seems intuitively obvious that non-cognitive personality traits are also involved in mediating success; Cattell *et al.* (1966) have gone as far as to suggest that 25% of the total variance may be accounted for by such traits. Much work has been done in relation to anxiety, neuroticism and extraversion-introversion, both with school children and with students, but results, although suggestive, have not been consistent, and correlations between personality and attainment have not usually been very high. There is a fair amount of agreement that both neuroticism (N) and extraversion (E) are relevant to success (Warburton, 1968), but the relationships observed seem to depend on the age of the subjects (or possibly on the formal nature of the teaching, or the selection

policies employed—these three factors are so closely interwoven that it is difficult to separate them out). At primary school, extraversion and stability seem to predispose the child to success; at secondary school, introversion and stability; at University, introversion and neuroticism (Eysenck & Cookson, 1969; Furneaux, 1956; Entwistle & Wilson, 1970). Minor complications are introduced in some studies by significant interactions between personality and sex (Entwistle & Cunningham, 1968), and some studies fail entirely to report significant differences between successful and unsuccessful students (e.g. Kline & Gale, 1971); nevertheless, the major findings quoted above are based on a reasonably large number of studies, and have been replicated sufficiently often to provide a likely approximation to the truth. Do they fit in reasonably well with theory, and can they be used in practice—and if so, how? These are the kinds of question we must address ourselves to if we wish to cross the border from academic research to practical applied work.

Let us consider first of all the neuroticism—anxiety concept, and its relation to personality and learning (Eysenck, 1971). Miller (1948; 1951) demonstrated in his classical rat studies that anxiety (i.e. conditioned pain reactions) acted as a drive, as well as providing reinforcement; as Spence (1956) put it, in these studies Miller showed “first, that neutral stimuli become fear arousing after association with noxious stimuli, and can serve as the basis for motivating an animal in a learning situation so that it strives to escape from them, and secondly, that reduction of the fear through cessation of the conditioned fear stimulus constitutes a reinforcing event in that it leads to the learning of those responses which it follows.” To the psychologist, then, anxiety is a drive, having all the properties of that concept in the Hullian system. Drive, as the Yerkes-Dodson Law already asserted (Broadhurst, 1959), has a curvilinear relation to performance; intermediate levels of drive are optimal, with both too-low and too-high drive producing sub-optimal performance. In addition, the law asserts that optimal levels tend to be lower for difficult, higher for easy tasks. These rather vague and imprecise observations have been put into a much more rigorous and hypothetico-deductive form by Spence (Spence & Spence, 1966). He starts out by observing that performance may be conceived as $\text{habit} \times \text{drive}$ (leaving out the many other factors which enter the Hullian equations); consequently accurate predictions regarding a person’s (or rat’s) activities when anxiety is aroused can only be made when something is known about his existing habits (i.e. his learning history). If the person is learning something new, i.e. where the responses to be learned are not opposed by different, previously learned responses, then high drive (high anxiety) should facilitate his learning, and he should perform better than a person working under a low degree of anxiety-drive. The classical example of this situation is to be found in Spence’s

work on eye-blink conditioning; high anxiety subjects (selected on the basis of the Manifest Anxiety Scale, or MAS) condition better than do low anxiety subjects. The reason for this is that there are no previous habits to interfere with the new learning, hence the drive multiplies with the newly acquired habit.

The position is quite different when the new learning has to compete with existing habits. Suppose we require our subjects to learn paired associates of the kind: Table—Fish. Here there is already in existence an extensively practised habit, Table—Chair; under high drive, this old habit is multiplied by the high drive, and is hence very difficult to eradicate. It should follow that in this situation, high anxiety subjects would have much greater difficulties in learning the new paired associate, and the evidence indicates that this is in fact so. Had our subjects been asked to learn pairs like Table—Chair, the high anxiety group would have been predicted to do better, and again the evidence bears this out. In these examples we have made use of pre-existing associations to illustrate our case, but in many experiments the associations existing prior to the experimental learning paradigm were actually manipulated by learning experiences in the laboratory antedating the experiments proper. Quite precise predictions are possible from Spence's theory, and most of these have been shown to be verified in appropriate experiments (Eysenck, 1971). Spence is surely right in suggesting that we should substitute for the concepts "easy" and "difficult," as they appear in the Yerkes-Dodson formulation, some more precise estimate of the existing habit strengths, and the degree to which they interfere with the learning process under investigation. This new formulation is a very important advance indeed.

Two problems remain. The first relates to the distinction between "state" and "trait" anxiety. To say that a person is high on anxiety (i.e. scores highly on the MAS, or the EPI neuroticism scale) means that his anxiety is easily aroused, and that he admits to many neurotic symptoms; nevertheless, he is not always in a state of high anxiety. Thus a very intelligent, well-prepared person who scores high on N may nevertheless enter the examination room quite calm and self-possessed because under the circumstances this situation does not provide the necessary stimuli for the arousal of his anxiety. On the other hand, even a person low on anxiety may upon occasion show strong emotional reactions. "State" anxiety thus refers to the actual reaction of a person to a particular situation, say an examination; this is likely to have some relation to his "trait" anxiety, but the relation is unlikely to be perfect, and may not even be very high. We can measure "state" anxiety by means of questionnaires asking for responses related specifically to the situation in question, such as: "Were you very nervous when you came into the examination room?" Predictions made about "trait" anxiety may not be verified when the situation does not give rise to anxiety; thus

several experimenters failed to verify Spence's original work on eye-blink conditioning because they took great care to reassure their subjects about the experiment, removed all dangerous-looking equipment from the room, and generally produced a universal level of low "state" anxiety even in high "trait" subjects. Spence himself made the testing situation as anxiety-provoking as possible, by having all the electrical equipment open to view, not reassuring his subjects, and generally arousing rather than allaying anxiety. Any test of the hypothesis linking anxiety-neuroticism with performance should incorporate measures of "state" anxiety in the experiment (Sarason, 1960); otherwise we have no reassurance that anxiety-prone individuals were actually anxious in the examination situation. Similarly, if we are concerned with the period leading up to the examination, rather than examination-anxiety itself, we should incorporate in our study a questionnaire concerned with "state" anxiety covering the period of concern. It is important to realize that in fact very few published papers have made this distinction, or have taken the necessary precautions to incorporate this additional information in the studies reported.

The second problem relates to the existence of drive stimuli (S_D) in the Hullian system, i.e. stimuli produced by, or in association with the drive in question (e.g. hunger pangs in association with hunger, or rapid heart beat in association with anxiety). These drive stimuli may, and often do, lead to task-irrelevant responses which in some situations may interfere with efficient performance; Spence (1956) and Taylor (1956) suggest that these are more easily elicited in high than in low anxiety subjects. Thus consider a student with high MAS scores, on the evening before the examination; his mounting anxiety produces strong S_D which induces him to perform some type of response which will reduce these stimuli. Animal studies have shown that whether an increase in D and S_D facilitates or interferes with performance depends in part on whether the response tendencies elicited by S_D are compatible with the response to be acquired or performed, or not (Amsel, 1950; Amsel & Maltzman, 1950). "Strong anxiety may thus generate behaviour which interferes with learning even though the learning is of the *simple* kind, i.e. does not involve stimuli already possessing strong but wrong responses; under these conditions, increasing drive might lead to worse performance" (Eysenck, 1971). Thus to reduce S_D the student may go out on a drinking spree (alcohol reduces the S_D associated with anxiety), get home late, and be in no fit state in the morning to cope successfully with his examination. Another student, perhaps more introverted, may try to reduce the strength of his S_D by going over his notes again and again; this might prove beneficial and improve his chances of passing the examination. Here again then one cannot say in any general sort of way whether high anxiety is beneficial or harmful; everything depends on the existing habits of the per-

son concerned, who in turn will have acquired these habits in line with his general personality make-up.

One mediating variable which has been investigated in this relation is that of study habits (Entwistle & Entwistle, 1970; Cowell & Entwistle, 1971); this is clearly a promising approach. Theoretically at least, introverted habit systems would seem likely to predispose students to engage in good study habits, so that high anxiety drive in introverts would lead to even more strenuous study. Unfortunately very little is in fact known about these habit systems that are activated whenever S_D level rises to an uncomfortable height; this might be a promising area of investigation. Here too, of course, "state" anxiety would have to be discriminated sharply from "trait" anxiety.

The facts presented would suggest that anxiety as a trait variable can have two sharply differentiated effects on learning and performance. Acting as a drive it may spur the individual concerned on to greater exertion and achievement; along the lines of this argument we would expect a positive correlation between N and achievement. On the other hand, if the anxiety drive multiplies with the wrong habits, or if the S_D are too strong and lead to behaviour disruptive or non-purposive in nature, then we would expect a negative correlation between N and achievement. As long as we cannot specify with more precision the parameters governing the appearance of these contrary effects, so long will our theory be incapable of making any useful predictions, or of being falsified by the facts. One possible variable to be considered here is selection. The advance from primary to secondary and tertiary education is achieved by surmounting various examination hurdles, and it seems likely that those high N individuals who fall into the second of our two groups, as outlined above, will fail to surmount these hurdles; their high N , acting in the direction of hindering, rather than helping them in achieving their goals, will predispose them to failure, and consequently eliminate them from reaching the higher stages. Thus one would be inclined to predict that N would show negative correlations with achievement at lower levels of education, where individuals in our second group had not been eliminated; at higher levels, particularly at University, individuals in our first group (i.e. those where anxiety acts as a drive multiplying with useful study and other habits) should predominate, and there one would expect a positive correlation. By and large the data seem to bear this finding out; negative correlations among children at school, positive correlations among students at University are the rule, with only isolated exceptions.

Why are there any exceptions at all? Two reasons come to mind. The first is related to the hypothesis advocated in the previous paragraph. Clearly, its applicability depends on the degree of selectivity implied in the process of passing from one stage to the other; the greater the degree of selectivity, the more applicable our model. This would lead one to consider that

this model was more applicable in the U.K. than in the U.S.A., where a much reduced degree of selectivity prevails; the proportion of school-leavers who go to University is much greater, and there is much less within-school streaming or selection. Thus in the U.S.A. we might expect to find that even at University level the correlation between N and achievement would still be negative. On the whole this seems to be so, although again with some exceptions; these may find a ready explanation in the great differences between different Universities and Colleges in the U.S.A., where no such agreement on standards of admission prevails as in this country (Spielberger, 1962). Again following our hypothesis, we should expect positive correlations between N and achievement at schools like Harvard, Yale, Berkeley and so on, and negative correlations at the lesser Universities and Colleges. Another prediction relates to the point in the student's progress through University when the study is done; the first year often acts as a selection filter in the U.S.A., so that what is true during the first year (negative correlation) may not be true during the second or subsequent years (positive correlation) —only those students stay on who have succeeded in harnessing their N-drive to the purposes of the University education.

A second reason for discrepant results may be related to the difficulty level of the material learned. There is no doubt that different subjects require different levels of ability and different degrees of hard work; this must be expected to interact with the effects of anxiety on the whole progress of the student. A student can obviously "get by" with much less work in language courses, or in the social studies, than in physics and mathematics; thus anxiety is less likely to interfere with his progress. This in turn may interact with the student's "personality fitness" for the particular course he has chosen; there is much evidence that introverts are better adapted to the study of the "hard sciences," extraverts to the fun and games of the social studies, languages and "arts" generally. A student who is in a course for which his personality fits him is less likely to develop "state anxiety," whatever his "trait anxiety" may be. There is unfortunately little evidence on these points, largely because they have not hitherto been much considered by workers in this field; hence nothing said in this paragraph goes beyond hypothesis. However, it is the purpose of this paper to draw attention to variables which ought to be considered in relation to the general topic, and these are probably relevant to the discussion.

Some indirect support for the notions developed in the last paragraph come from the work of Spielberger (1966) on the interaction between anxiety and ability in academic success. Having grouped his subjects into HA (high anxiety) and LA (low anxiety) groups, he again subdivided them according to intelligence (5 grades of scholastic aptitude). The mean grade point averages of these 10 groups were then established, and it was found that at the

lowest and at the highest ability levels LA and HA groups did not differ in achievement; in all intermediate levels the LA groups were superior in achievement. Spielberger explains this finding in terms of threshold and ceiling effects; very bright students find the course easy, and hence no anxiety is called into play. (At the low ability level, he argues that this is due to the practice of not giving grades below C at all frequently, thus providing a "floor" for poor students.) Whether his explanation, and our hypothesis, are correct or not, clearly it is necessary to take ability into account in predicting the effects of high anxiety on achievement; a very bright high N scorer is in a completely different situation from a dull high N scorer! (Alpert & Haber, 1960; Desiderato & Koskinan, 1969; Lin & McKeachie, 1970.) The same applies to the other factors mentioned, such as difficulty level of the course, and personality "fit" to the course subject.

If we are right in thinking that the high N student population is made up of two quite distinct groups, one helped by its high N, the other impeded, then it should be possible to sort out the latter group on the basis of complaints about difficulties encountered by them in the course of their studies and examinations, and furthermore it should be possible to help them quite effectively by means of some form of "desensitization" or even psychotherapy. This problem, as expected in terms of our theory, is perhaps greater in the U.S.A. than in the U.K., and Spielberger comments on the loss to society which is occasioned by the failure of bright and well-trained students whose only fault is their inability to cope with their anxiety. A large number of studies have been published (e.g. Cohen, 1968; Crighton & Jehu, 1969; Dixon, 1966; Emery & Krumboltz, 1967; Carlington & Cotler, 1968; Katahn, Stenger & Cherry, 1966; Kondas, 1967; McManus, 1971; Spielberger & Weitz, 1964; Spielberger, Weitz & Denny, 1962; Suinn, 1968) to show that it is not only possible to counteract the detrimental effects of anxiety in the academic situation, but that is reasonably easy to do so. Many different methods of treatment have in fact been tried, and most seem to have been successful. It seems unfortunate that the practice of having psychological units performing such clinical functions associated with the University is almost completely American; English Universities, too, have their quota of such cases, and as the number of students accepted increases, it must be assumed that the proportion of maladapted high N persons will increase, and necessitate some form of psychological help. To give such help, whether by means of behaviour therapy or otherwise, would seem a more useful way of utilizing modern personality theory than by using present-day questionnaires for the purpose of selection. High anxiety may be a defect in some people, but it is an asset in others, and even where it is a defect it seems easy to assist the person so afflicted to remove this defect. Forthcoming articles in *Behaviour Research and Therapy* show how this defect can in fact be turned into

an advantage, very much in line with the general Spence-type theory here proposed, by alerting the student to the occurrence of drive stimuli, and by training him to respond positively and helpfully to these S_D , thus making optimum use of the strength of his anxiety drive.

Spielberger (1966) had expected that for the high anxiety students for whom he provided a counseling service, discussions of experiences which had induced anxiety prior to their entering college would occupy much of the time; this was not so. "We found instead that the students were concerned almost exclusively with anxiety-arousing aspects of their present circumstances, and with finding effective ways to cope with the stresses encountered in their new environments." Their anxiety was thus "related to immediate problems and situations and not to past experiences, despite the counselor's interest in helping them to deal with the underlying sources of their anxiety." The topics which were most frequently dealt with in the counseling group included "methods of study, individual academic difficulties, relations with professors in class and on the campus, dormitory life, vocational goals, etc. The student wanted to know how to study, how to prepare for examinations, how to figure out what instructors expected of them, how to budget their time, and how to get work done in dormitories amid the distraction of noise, interruptions, and incessant social demands. Thus, although as counselors we anticipated and were prepared to deal with expressions of more basic personal and emotional difficulties, these did not play a central role."

Spielberger also drew attention to the similarity of results from laboratory and from the clinic. "The data obtained in both the clinic and the laboratory pointed to the centrality and significance of situational or stimulus factors in arousing anxiety and in determining the effects of anxiety on behaviour. For the clinician who works with anxious college students, it would seem especially important to deal with the students' reactions to stressful environmental stimuli." These findings are in good accord with a conditioning-type theory of the growth of anxiety (Eysenck & Rachman, 1965). It would be of considerable interest to have similar detailed findings about the way anxiety responses are generated and directed in high N students who in fact do well, i.e. in whom the beneficial drive properties of anxiety have not been obscured by reactions to S_D inappropriate to the academic environment. Much the same can be said about school children; we lack almost completely the detailed, personal study of individual high N children and their specific modes of adjustment to the learning/examination situation. It seems likely that such studies, undertaken with special reference to the general theoretical system here outlined, would contribute considerably to our limited knowledge in this field.

One great drawback in the American work on anxiety is the failure of most writers to pay attention to the dual nature of MAS scores. The MAS

correlates quite highly with N, but it also correlates significantly with E (negatively); when subjects are taken from among extreme high and low scorers on the MAS, this means that high scorers come almost exclusively from the dysthymic quadrant (neurotic introverts), while the low scorers come almost exclusively from the stable extravert quadrant (Eysenck & Eysenck, 1969). In this way it is impossible to interpret the findings with the MAS in any unambiguous manner; differences between high and low MAS scorers could be due to N, to E, or to a combination of the two. Our interpretation of the evidence has been largely in terms of the N component, but it remains possible that the contribution of E has been under-rated in this; only a repetition of this work, using a less idiosyncratic scale, can really throw light on this question. Eysenck (1971) has discussed a number of studies which demonstrate that in many learning situations E and N interact in a manner which is to some extent predictable from general theory.

When we turn to the specific findings relating extraversion to school and academic achievement, there is little doubt that introverts usually do better in secondary and University education, extraverts in primary education (Eysenck & Cookson, 1969). The reasons for this are not entirely clear, although the superiority of the introverts in higher education does not seem to present much of a problem. Good study habits are not easily compatible with an outgoing, very social, impulsive style of life; furthermore, introverts, as the theory asserts, have become conditioned more easily to the predominant academic mores which make for success in Academe. Long-continued application to lectures or reading matter must be supposed to set up inhibition more easily in extraverts than in introverts, with consequent avoidance symptoms on the part of the former. Why do these considerations not apply to primary school children? Eysenck & Cookson (1969) suggested that introverts may be "late developers," but other hypotheses suggest themselves. The informal, "bitty" nature of primary school instruction may suit extraverted children better; when instruction becomes more concentrated and serious, the extravert's interest begins to fade, and inhibition sets in more easily. One unpublished study showed that in a primary school where instruction was more formal and academic modes of teaching were more closely approached than is usual, introverts were in fact superior to extraverts. Only follow-up studies, paying special attention to the precise nature of the teaching process (formal vs. informal, or whatever distinction may turn out to be most relevant) can answer the questions raised; in all such studies, special attention must of course be paid to the interaction of personality with intelligence. It is not easy to imagine that personality factors express themselves uniformly over all ability groups, even when type of teaching is held constant; for analysis, groups of extraverts should be compared with groups of introverts, each subdivided into ability grades as in the

Spielberger study mentioned above. Without such more detailed analysis, it is doubtful if precise relationships can be established between personality and achievement.

In a short paper it is impossible to go into all the complexities which attend the delineation of the relationship between personality and achievement; what I have tried to do has been to suggest some of the factors that ought to be borne in mind when trying to apply certain theoretical models either in research or in practice. It is clearly quite out of the question to make sensible predictions of the simplistic kind: Introverts always, under any conditions, do better at scholastic and academic tasks than extraverts, or high N scorers always, under any conditions, do better (or worse) than low N scorers. It is of course easy to test such "hypotheses," but the outcome is likely to be confusion, lack of replicability, and uniformly low correlations even where replication is successful. It is necessary to recognize the problems presented by sex differences, ability differences, differences in educational programmes and objectives, interaction effects, non-linear regressions, as well as the complex nature of the theory on which predictions are made; these predictions relate to clearly specified interactions between drive and habit, but require for their verification some knowledge of the existing habit systems, as well as knowledge about the strength of drive stimuli, and habitual methods of dealing with them. This is not the place for outlining appropriate research designs; my point has been rather to indicate the sort of information that is required before any appropriate testing of existing theories in this field becomes possible. Many educationists and psychologists have expressed concern about the lack of replicability of results, and about the lack in predictive accuracy of many of the published researches; if the considerations advanced in this paper have any basis in fact, then we should cease to be astonished at this lack of success. The apparent ease with which questionnaires can be administered to large groups, and the availability of some measures of scholastic success, have led to a proliferation of simple correlational studies, usually without any formal basis in psychological theory, or basing themselves on a grossly oversimplified version of some such theory. Work of this type is not likely to get us very far, and the disappointment felt by so many "consumers" of the research literature is fully justified. Fortunately psychology can do better than that, and it is hoped that the future will see a closer integration of laboratory work and studies in educational settings; with few exceptions, workers in the one field have paid little attention to what those in the other were doing. As I pointed out at the beginning of the article, the application of even good theories raises quite difficult problems which can only be overcome by close cooperation of theoretical and applied scientists; the field here reviewed seems ripe for such cooperation.

*LA PERSONNALITE ET LA REUSSITE UNIVERSITAIRE:
UNE APPLICATION DES PRINCIPES PSYCHOLOGIQUES AUX OBJECTIFS
DE L'ENSEIGNEMENT*

Résumé

Dans l'enseignement il importe que la recherche expérimentale applique avec méthode les théories psychologiques classiques pour les mettre à l'épreuve. Pourtant, la simplification abusive d'une théorie mène souvent à des hypothèses inadéquates et à des résultats non concluants ou incompatibles. Dans la recherche sur la personnalité et la réussite universitaire on a souvent voulu tirer directement d'une formulation ancienne de Hull des hypothèses sur les effets du caractère névrotique. On cite des exemples de conduite scolaire des étudiants, pour montrer quelques adaptations récentes de cette théorie fondamentale. Il faut distinguer en particulier entre l'anxiété comme "trait" et l'anxiété comme "condition", et prendre en compte l'effet du système antérieur des habitudes. Les habitudes qui sont fermement établies modèlent les types de conduite provoqués par les stimuli significatifs, tels que, par exemple, les examens imminents.

On peut voir la variable de l'anxiété, considérée comme "trait", agir de façons opposées en facilitant ou en entravant la réussite en fonction des caractéristiques de l'individu et des stimulants significatifs. Dans la progression de l'enseignement primaire à l'enseignement supérieure on observe une élimination progressive des individus dont le caractère névrotique exerce un effet défavorable sur la réussite; on peut par conséquent prédire une corrélation positive entre les résultats et le caractère névrotique au niveau universitaire.

Bien que les rapports entre l'anxiété et la réussite soient des plus complexes, il est évident que, au niveau de l'enseignement supérieur, il y a une liaison assez forte entre l'introversion et le succès. Il est probable que le niveau élevé de réussite est dû aux meilleures habitudes de travail de l'introverti et à sa capacité de s'adapter facilement aux moeurs universitaires dominantes. En outre, l'accumulation d'une inhibition réactive chez les extrovertis, pendant les cours ou les périodes d'étude prolongées tend à produire des "symptômes d'annulation".

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