

THE PERSONALITY CORRELATES OF JOB-SATISFACTION
AMONG SCHOOL TEACHERS

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Summary

This thesis is concerned with the identification and prediction of job-satisfaction among school teachers. The primary bases of prediction investigated were teacher personality factors, expressed in terms of the Eysenck and Cattell systems of personality description. Additional bases of prediction were certain factors in the teachers' working environments.

The development of two questionnaire scales of measurement of job-satisfaction is described, of which the first is for teachers in training (scale of anticipated job-satisfaction) while the second is for serving school teachers. Research with the first questionnaire, involving a sample of 37 postgraduate trainee teachers revealed no significant relationships between any aspects of their personalities and the degree of job-satisfaction they anticipated experiencing in full-time employment. Research with the second questionnaire, involving 68 serving teachers, revealed significant and substantial associations between teacher job-satisfaction and teacher personality expressed in terms of the Cattell factors A, F, I and Q₁ (Affectothymia, Surgency, Premsia and Conservatism respectively). It is estimated that these four predictors taken collectively account for 37% of the variance in teacher job-satisfaction in the population represented by the sample.

Research with the second questionnaire, involving a further 163 teachers, revealed significant relationships between job-satisfaction and factors such as teacher-specialisation, sex of teacher, ages of children taught, salary scale and degree of involvement in school management. Collectively, these factors accounted for some 25% of the job-satisfaction variance within the sample.

The bases of this research and the various findings are interpreted and discussed in the context of job-satisfaction theory, personality theory, and previous cognate research. Several suggestions for development are offered, especially into the influence upon job-satisfaction of a teacher's involvement in the decision-making processes within his school.

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Teacher Personality and Job Satisfaction.

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Abbreviations and Notations

Where abbreviations are used they are explained in the text. The ones

which are used frequently are: J/S - Job satisfaction

A.J.S. - 'anticipated job-satisfaction'

The arithmetical multiplication sign is consistently represented by

the symbol \cdot e.g. $3 \cdot 5 = 15$

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Vocational guidance and selection procedures generally have two objectives. Firstly that of identifying those who because of their aptitudes abilities etc. are likely to satisfy the competence demands of prospective employment, and secondly that of identifying those who for various reasons are likely to be 'contented' in their prospective employment. It is with this second objective that the research reported here is broadly concerned.

To be happy in one's work is a privilege which some might argue is the prerogative of the few rather than of the many. However, people clearly experience varying degrees of job-satisfaction in their work and there is no simple division between those deriving and those not deriving satisfaction from their daily employment. One of the objectives of the work described here is to develop, refine and validate a scale of measurement of job-satisfaction for teachers working in infant, junior and secondary schools in Great Britain. Teacher job-satisfaction is the dependent variable of the research, and the location and analysis of some of its determinants (independent variables) is its primary aim.

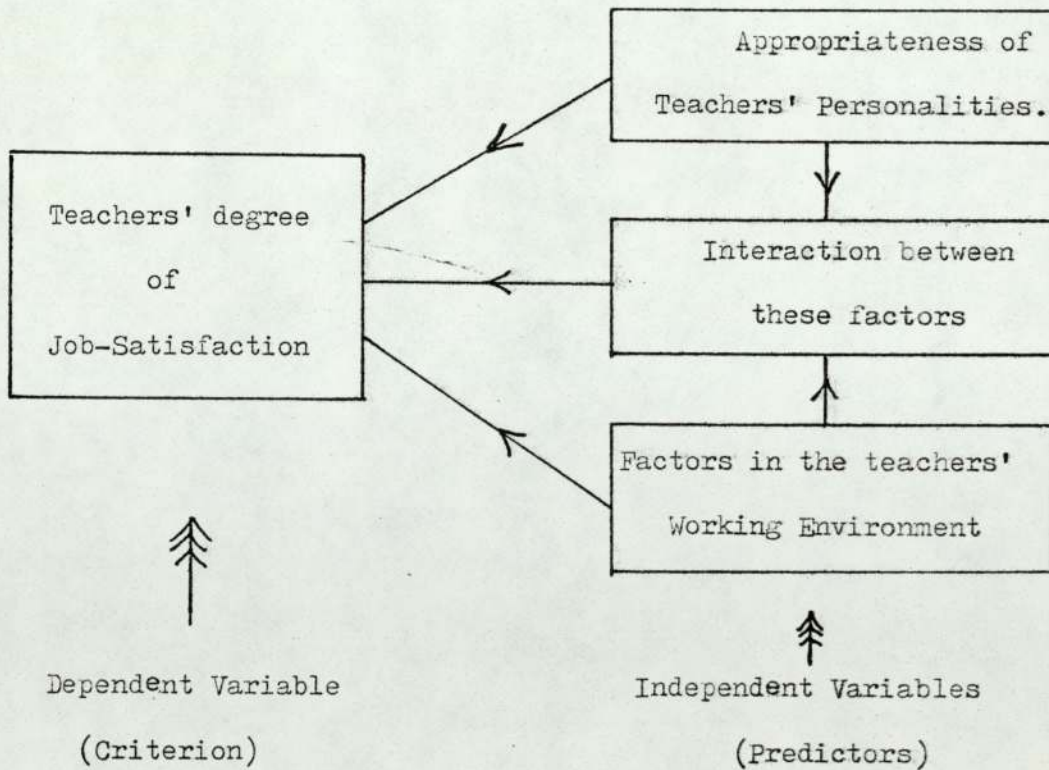
The general hypothesis under scrutiny is that in the work of a teacher, work whose duties, activities and circumstances are fairly well circumscribed, part of the variation in the degree of job-satisfaction experienced by its practitioners can be accounted for in terms of their personality characteristics i.e. that a teacher's experience of job-satisfaction is partly dependent upon what kind of person he is in character and temperament. In other words, it is hypothesized that a certain kind of person (a round peg) will enjoy working with children in schools (a round hole) while those of different characteristics (square pegs) will experience less job-satisfaction in this work.

It is nevertheless acknowledged that a teacher's experience of job-satisfaction will also depend to some extent upon the particular job circumstances in which he finds himself (such as school-type, pay, status, involvement in decision making etc.) and the opportunity has been taken of exploring the direction and magnitude of the influence of some of these factors.

The problem of the dependence of job-satisfaction upon the interaction between teacher characteristics and aspects of his working circumstances is not explored here but could well be a topic of developing research.

The conceptual framework of this thesis is illustrated in Fig.1.1 below.

Fig.1.1 Variables involved in the research



It is thus readily apparent that the basic strategies of the research involved securing measures of job-satisfaction, personality characteristics and work environment factors from a sample of serving teachers. An assumption made, which will be discussed later, is that there do exist personality characteristics which are relatively stable over time for any individual, so that any empirically determined links between personality and teacher job-satisfaction will provide additional bases for the provision of vocational guidance for students contemplating embarkation upon a teacher-training course.

A further consideration is that teachers in training are required to carry out periods of teaching practice in schools, and this experience will inevitably form a basis for their judgement of the degree of job-satisfaction they are likely to derive from subsequent full-time employment. (In the writer's experience, such judgements often cause students to drop out of their training courses or otherwise abandon their vocations.) For this reason it was considered worthwhile to make some study of the relation between the personality characteristics of trainee teachers and their anticipated job-satisfaction in full-time employment. Clearly, if it can be shown that the personality/anticipated job-satisfaction relationship for trainee teachers is substantially different from the personality/job-satisfaction relationship for serving teachers, then it would be possible to counsel trainee teachers with this additional insight. This is especially important in those cases where students have distressing teaching-practice experiences during their professional training. In consequence, part of the research effort was devoted to an investigation of the relation between personality characteristics of post-graduate students on teacher-training courses and their anticipation of job-satisfaction, derived from their teaching practice experiences.

The material which follows, includes an analysis of the nature of job-satisfaction, a discussion of the systems of personality description and measurement upon which this work is based, a review of some of the literature relating personality type to work attitudes and an account of the various empirical research processes which were carried out, together with analyses of their results and discussion of their implications.

2.1 Definition

Job-satisfaction is taken here as being synonymous with 'attitude towards one's work', i.e. as a psychological variable which is amenable to measurement, with a degree of refinement approaching that of interval scaling, by the established methods of attitude measurement. The general meaning of 'attitude' has been variously interpreted, e.g. Allport (1954)

'a mental and neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual's responses to all objects and situations with which it is related.'

or Krech and Crutchfield (1948)

'An attitude can be defined as an enduring organisation of motivational, emotional, perceptual and cognitive processes with respect to some aspects of the individual's world.'

Comparing these two classic definitions it will be observed that Krech and Crutchfield specify several of the response modes characteristic of an individual's attitude, acknowledging the multi-dimensional nature of the concept. Definitions in this context are never either right or wrong and are perhaps better regarded as stipulations. One man's attitude definition may confine itself to affective behaviour (feelings) and call the cognitive aspects of another man's definition 'beliefs'.

For the purpose of this thesis, attitude will be used in the most global sense. Attitudes are regarded as having 'affective' aspects - they represent feelings, positive or negative in varying degrees, towards the attitude object, 'cognitive' aspects - beliefs about the attitude object, and 'conative' aspects - tendencies to behave in particular ways towards the attitude object.

Whilst it has been argued that affective, cognitive and conative factors ought to be treated separately, since they are not necessarily correlated, e.g. by Fishbein and Coombs (1974), the methodology of attitude measurement employed in this research does permit appraisal of the degree of correlation between these various dimensions, all of which are represented in the attitude scales devised.

In summary, the work presented herein is concerned with teachers' feelings, beliefs and actions vis a vis their work in classrooms and schools.

2.2 Job-Satisfaction - Models, Theories and Empirical Accounts

2.2.1 Motivation Theory

The 'drive-reduction' theory of human motivation developed by Clark Hull (1943, 1952), partly based upon Cannon's (1932) homeostasis principle, provides a powerful and comprehensive explanatory model of human behaviour. Its principal proposition is that all human activity is directed towards (or concerned with) the satisfaction of human needs. It is an all-embracing theory, in that it can account for such diverse examples of human activity as solving cross-words, breeding pigeons, scrubbing floors, telling jokes, running for buses, lighting fires etc. It assumes that each individual is characterised by a unique set of needs, varying in their pre-potency, which serve as a basis for controlling his behaviour. When any particular need is in a state of non-satisfaction, the individual is in a drive state or motivated condition, and will engage in behaviour which he knows, either instinctively or through experience, will lead to need satisfaction and reduction in drive state.

Needs can be classified into three categories:-

- (a) Physiological needs - those satisfied by material substances or circumstances,

- (b) Social needs - those, whose satisfaction depends upon interaction with other people,
- (c) Cognitive needs - those, whose satisfaction depends upon mental activity and experience.

Needs and need-systems can be identified in various ways but a clear weakness of this general theory is that it seems possible to go on inventing needs, almost without limit, in attempting to account for more and more diverse facets of human behaviour.

One celebrated analysis of human needs is that derived by Murray (1938) on the basis of interviews with large numbers of people about what 'turned them on'. His list of 20 social needs (they would not all be classified as 'social' in the scheme given above) provides a sensitive and comprehensive framework of human personality description by motivational patterning. Murray's list is given in Table 2.1 below and in an expanded form in the appendices Table 9.1

Table 2.1 List of Murray's Social Motives

Abasement	Achievement	Affiliation	Aggression
Autonomy	Counteraction	Defendance	Deference
Dominance	Exhibition	Harmavoidance	Infavoidance
Nurturance	Order	Play	Rejection
Sentience	Sex	Succorance	Understanding

Job satisfaction is accounted for by motivation theory on the assumption that the degree of satisfaction experienced in one's work is dependent in a simple sense upon the range and extent of the need-satisfaction which the work provides. It is easy for example to identify in the Murray list specific needs which are potentially satisfied in working as a politician (dominance), nurse (nurturance), or conjuror (exhibition). On the other hand the question of primacy or priority of needs would have to be taken into account. It would be difficult to imagine anyone getting a great deal of satisfaction from

work which provides for all 20 of the Murray needs but which did not provide enough financial reward to keep body and soul together.

The question of priorities in response to needs has been considerably explored by Maslow (1943, 1968, 1970, 1973) whose development of the drive reduction theory of human motivation has received considerable attention in the literature on job-satisfaction. Maslow identifies five classes of needs viz. physiological needs, safety needs, social affiliation needs, self-esteem needs and self-actualisation needs. He argues that these classes of needs form an hierarchy from self-actualization at the top, through esteem, social and safety needs to physiological needs. The lower-order needs are seen as prepotent, they are personally the most significant and until they are satisfied to some acceptable degree, and only then, can the higher needs be responded to. Maslow utilized the two concepts of deprivation and gratification to provide the dynamic forces that linked needs to general behaviour. He used the deprivation concept to establish 'dominance' within his hierarchy of needs, postulating that deprivation or dissatisfaction of a need of high prepotency will lead to the domination of this need over an individual's personality. Following the satisfaction of a need, the second element of the dynamic force in Maslow's theory will then come into operation. Gratification of a given need submerges it and 'activates' the next higher need in the hierarchy. This need then dominates the individual, so that for example instead of being obsessed with hunger he becomes obsessed with personal security (safety).

This process of deprivation → domination → gratification → activation continues until the physiological, safety, affiliation and esteem needs have all been gratified and the self-actualization need has been activated.

Motivation theory and especially Maslow's theory has been used as an explanatory system in several studies of job satisfaction. Roe (1956) was among the first to use Maslow's ideas explicitly in a theory of vocational development. Schaffer (1953) and Walsh (1959) similarly based their investigations into job satisfaction upon motivation theory.

More recently however, the usefulness of Maslow's theory as an explanatory model of job satisfaction has been called into question. This is because the Maslow theory has not been effectively validated by empirical work. Wahba and Bridwell (1973) reviewing research into various elements of Maslow's need hierarchy conclude:

"Maslow's theory has received little clear or consistent support from the available research findings. Some of Maslow's ideas are totally rejected, while others receive mixed and questionable support at best. The descriptive validity of Maslow's need classification scheme is not established although there are some indications that low-order and high-order needs may form some kind of hierarchy. However, this two-level hierarchy is not always operative, nor is it based upon the domination or gratification concepts. No strong evidence supports the deprivation/domination proposition except with regard to self-actualization. Self-actualization, however, may not be a basic need, but rather a romantic throw-back to the eighteenth century notion of 'noble savage'. That is it may be based more on wishes of what man should be than on what he actually is. Furthermore, a number of competing theories explain self-actualization with more rigour than does Maslow's theory. Longitudinal data does not support Maslow's gratification/activation proposition, and the limited support received from cross-sectional studies is questionable because of numerous measurement and control problems."

Although these authors acknowledge that Maslow's theory is perhaps not quite as testable as other psychological theories, their conclusions must be somewhat distressing to adherents of the theory.

2.2.2 Herzberg's Two-Factor Theory

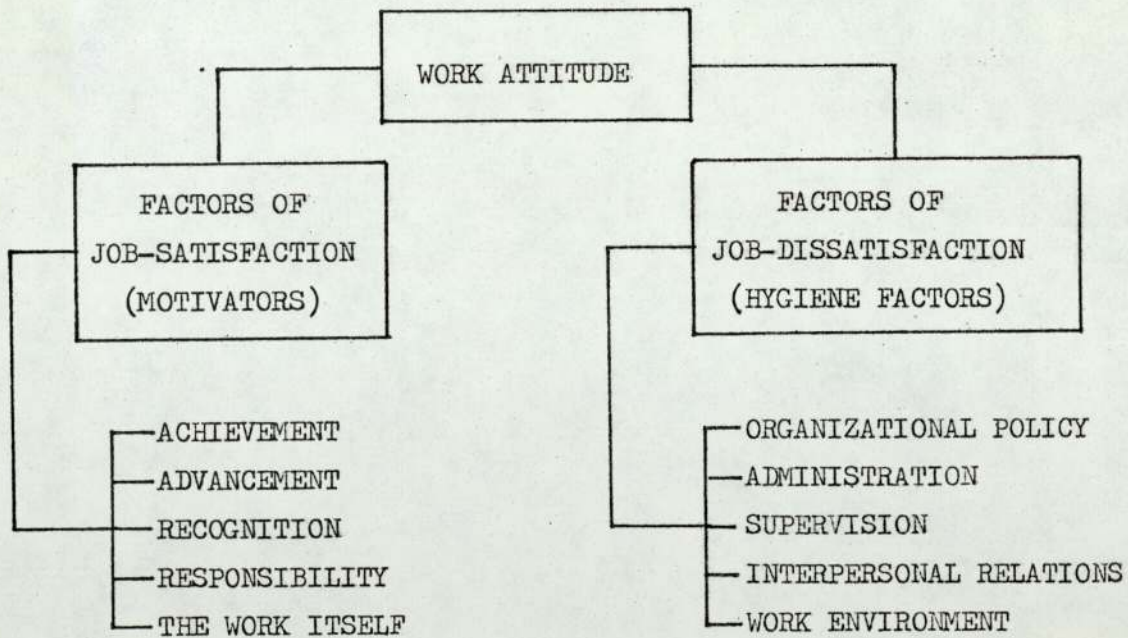
A theory related to Maslow's which from its inception has been concerned specifically with the organization of work attitudes is that of Herzberg et al. (1959). During the late 1960's this theory generated more research investigations than any other in the field of work attitudes. The principal proposition of the two-factor theory is

that the determinants of job-satisfaction are qualitatively different from the determinants of job-dissatisfaction. Having reviewed the job-satisfaction literature, Herzberg (Op. cit.) writes:

"The one dramatic finding that emerged was the fact that there was a difference in the primacy of factors, depending upon whether the investigation was looking for things the worker liked about his job, or things he disliked. The concept that there were some factors that were 'satisfiers' and others that were 'dissatisfiers' was suggested by this finding. From it was derived one of the basic hypotheses of our own study."

The results of Herzberg's (1959) study and of other subsequent studies yielded broadly consistent results. The five sources of job-satisfaction identified by Herzberg (which he called 'motivators') and five sources of dissatisfaction (hygiene factors) are shown in Fig.2.1 which seeks to illustrate the Herzberg theory.

Fig.2.1 The elements of Herzberg's 2-Factor theory of attitude to work.



Herzberg argued that the 'motivators' are factors intrinsic to the performance of work itself, while the 'hygiene' factors are extrinsic to the performance of work, being aspects of the work environment rather than of the work itself. Herzberg's view is that the hygiene factors are strong sources of dissatisfaction but not sources of

satisfaction. To use a medical analogy, without them we are unhealthy, but increasing them beyond a specific level does not make us more healthy. For example, an inadequate administration may cause an employee to be dissatisfied with his work, and this dissatisfaction will cease to exist under sufficiently improved administration. However, improving the quality of the administration far beyond an adequate level does not make an employee more satisfied with his work.

Thus a dichotomy is proposed, where factors of one kind can promote job-satisfaction while others can determine job dissatisfaction. This view is in conflict with the traditional idea that any factor may cause satisfaction or dissatisfaction depending upon the degree to which it is present or absent.

It is easy to spot a similarity between Herzberg's and Maslow's ideas. Herzberg suggests that job-satisfaction cannot begin to 'take off' until the appropriate level of the hygiene factors prevails. Maslow suggests that we cannot respond to higher level needs until lower needs are in a state of satiation.

Wall and Stephenson (1970) reviewing research based upon the Herzberg theory, show that whereas numerous studies, typically using methodologies similar to that originally used by Herzberg, have provided support for the two-factor distinction, equally as many investigators, usually adopting different strategies, have not. Almost all the studies which failed to confirm the Herzberg theory do so because intrinsic factors (motivators) are found to be determinants not only of job-satisfaction but also of job-dissatisfaction. Notwithstanding, Herzberg's theory is both stimulating and also possessing of that most desirable quality of a psychological theory viz. the capacity to generate testable hypotheses.

2.2.3 Equity Theory

This theory is less comprehensive in its scope than the grander theories discussed previously and tends to be concerned with material rewards in the context of job-satisfaction, though it is perfectly well applicable to non-material rewards such as status or responsibility. The general idea of equity/inequity had been expressed by Homans (1961) and Jacques (1961) but was developed into a more substantial theory by Adams (1965). Adams proposes that a state of inequity exists for an individual when he perceives/believes that

"the ratio of his outcomes to inputs and the ratio of others' outcomes to others' inputs are unequal." Adams (Op. cit.)

Outcomes are rewards such as pay or job status, which a person receives for his work. Inputs represent the contributions a person brings to his work such as age, educational qualifications and work effort. While it is difficult to handle the idea of 'ratios' of inputs to outcomes with any strong mathematical meaning, since inputs and outcomes are measured in greatly dissimilar scales, the essence of the inequity concept does have, at the intuitive level, clear psychological meaning. We may experience 'inequity' when we compare ourselves with others. These others may work in the same profession and in the same or different institutions, or may work in different professions. If we feel that the relationship between what we get from our work and what we put into it is different from the relationship we believe exists in the case of someone with whom we compare ourselves, we experience inequity - we don't think it's fair. For example a three-year trained nurse working seven 12-hour shifts every nine days, receiving a salary of £1500 per year and little apparent appreciation from the public, will doubtless experience considerable inequity if she compares her lot with that of a three-month trained air hostess doing one flight a week and receiving a salary of £4000 per year together with the attendant glamour. It is clear that there can in fact be two

kinds of inequity. The nurse comparing herself with the air hostess will experience what might be termed 'positive' inequity, while the hostess comparing herself with the nurse would experience 'negative' inequity (I'm all right Jack).

Adams (Op. cit.) suggests that the experience of inequity is a source of tension (cognitive dissonance ?) which acts as a driving force to behave so as to reduce the input/outcome discrepancies which cause the inequity. Goodman and Friedman (1971) reviewing the empirical evidence concerning inequity-resolution behaviour in the context of Adam's theory, conclude (as is so often the case) that some studies confirm hypotheses derived from the theory, while others do not appear to do so. Whether or not empirical work supports Adam's theory, it is felt that the inequity concept is a useful one in relation to job-satisfaction. The details of the way in which job-satisfaction among school teachers was measured are described later, but it is appropriate to indicate at this stage that some of the elements of the measuring process are based upon the assumption that positive and negative inequity experiences correlate with other job-satisfaction factors.

2.2.4 Empirical derivation of job-satisfaction factors

While theories of job-satisfaction have the appeal of comprehensiveness and parsimony, their questionable validity presents the student of work attitudes with certain problems. These can be partly, though not entirely satisfactorily, resolved by adopting an empirical stance. This means that the only factors which can be reliably assumed to relate to job-satisfaction are those which have been empirically demonstrated to do so. Dissatisfaction with this approach derives from the fact that it would be ambitious to assume that the complete domain of work attitude factors has been empirically identified. Some nine or so factors relating to job-satisfaction are

distinguished. The first, and perhaps most obvious of these is financial reward and economic security. The relative importance of this factor appears to diminish as we ascend the social scale. For example Nosow and Form (1962) conclude from consistent findings that:

"workers of the lower skill and socio-economic levels regard their work more frequently as merely a way to earn a living, and in general recognise fewer extra-financial meanings in their work than do workers of higher skill and socio-economic levels. Extra-financial meanings become more and more important as we ascend the occupational skill ladders."

This general finding concerning the relative importance of pay in job-satisfaction between the different social classes is certainly consistent with Maslow's theory. If we assume that the higher social class groups' need for economic security (a low need in the hierarchy) is more adequately satisfied by the higher wages they receive, then consistent with the theory, they will look for other, higher level, sources of satisfaction in their work.

A second factor of job-satisfaction is the degree of opportunity that work provides the individual with to relate himself to society. As Morse and Weiss (1955) point out

"if men work only for money, there is no way of explaining the degree of dislocation and deprivation which retirement, even on an adequate salary appears to bring to the formerly employed."

They argue that work can serve for the individual as an organising principle, in the sense of accepting him into society and enabling him to perceive himself as making a useful contribution by providing goods and services.

The third of these empirically determined factors of job-satisfaction is identified by Salaman (1974)

"....work may serve sociability needs by providing the individual with opportunities for interaction with others. The workplace has always been for some a place to meet people, converse and perhaps form friendships...."

and by Mannheim (1951) who writes of

"joy in co-operation, the sense of team membership, response to discipline, pride in skilful mastery of tasks...."

when discussing the meaning to an individual of not only his membership of a work group, the sharing of sociability, values and collective pride, but also of participation in a shared and integrated purpose.

The fourth factor is the opportunity work provides the individual in sustaining his status and self-esteem. In other words work has the potential for satisfying a person's need for self-esteem where such a need exists. The greater this need manifests itself in any individual, and the more it is satisfied by his occupation, then generally the more favourable will be his attitude to his work. Status and self-respect are derived both from the fact of having work and from the nature of the work one has. The effects on an individual of losing his job can be extremely damaging to his self-esteem, and traumatic in other ways. Sofer (1970) cites several research reports which indicate that

".... the release from the discipline of regular work was accompanied by family tension and emotional disturbance; that economic distress was sometimes the crucial last straw in breaking up a marriage; that the children of unemployed persons are susceptible to loss of prestige among school fellows; that the unemployed father may lose his authority over his children, and esteem and leadership within the family (especially if the wife takes a job)"

The relationship between the degree of self-esteem-need satisfaction a person derives and the nature of a person's occupation is probably not a simple one despite Sofer's suggestion that generally

"The job is a key element in wider social status. With a few exceptions a man's occupation is a more reliable guide to his place in society's hierarchy of prestige than any other indicator. We rank people by virtue of their occupation and tend to categorize people by occupation in dealing with them."

it is likely that the status we feel we have by virtue of the work we do, is a function of the nature of the social group whose respect we might wish to secure. A tool-room foreman may obtain considerable status satisfaction vis-a-vis the tool-room workers but rather less.

vis-a-vis the executive directors.

A fifth source of satisfaction in one's work, identified by Sofer (1970) is its ability to supply an individual with an identity - a place in society, a knowledge of who one is and what one's purpose is in the scheme of things. Sofer (1970) concludes that

"occupational roles provide opportunities to define oneself to oneself and to others, to enter into a stable set of relations with colleagues or clients and to acquire an ideology that explains one's place in the world."

A sixth factor, again referred to by Sofer (Op. cit.), is perhaps more important to many people than they perhaps realise.

"Work roles structure the passage of time through requiring that one must be at a particular place or carry out a particular activity at a particular time."

The importance here is of work providing a routine that wards off boredom, structures one's life, passes the time, offers something to do. Friedman and Havighurst (1954) report that

"Even the people who dislike their work as dangerous, unpleasant or monotonous often recognise the value of the work routine to them and cannot imagine how they would fill the day if they were to retire."

A seventh factor, related to the previous one, is the value of work in 'helping to distract' the individual from private worries, fears, disappointments, depression and emotional disturbance. The professional, for example, who commits himself totally to work can be reacting to, as well as causing, the failure of his marriage. Loneliness, isolation and fear of death are also known to lend work this kind of meaning. (Fox 1976)

Fox (Op. cit.) also suggests two other factors of job-satisfaction which he regards as being empirically self-evident. The one is the function of work in providing scope for the satisfaction of achievement-need (N.Ach, as McClelland - 1961 - would put it), usually defined in terms of a 'struggle towards high standards that are

recognised as such by some valued group.' (Fox 1976). Occupations differ widely in their ability to satisfy achievement needs, but again it would be an oversimplification to suggest that different jobs could be placed along some kind of continuum in this respect. The experience of varying degrees of achievement is related to individual aspirations. An octogenarian who climbs Ben Nevis may gain just as much satisfaction as a man in his prime who climbs Everest.

The other self-evident factor proposed by Fox concerns a human need to behave altruistically

" it is a fact of observation that many people may derive meaning from a job if they are conscious of contributing to some transcendent cause with which they feel able to identify. This cause may be the well-being of other people or (of) an organization to which they feel proud to contribute."

It will be observed that several of the sources of job-satisfaction discussed in this section are of the 'manifest' kind, in that people are conscious of the ways in which these factors influence their attitude to their work. Other factors however are of the 'latent' kind. Only when we are deprived of work by retirement or redundancy do we perhaps become more fully aware of some of the ways in which our work was satisfying some of our various needs.

2.3 The measurement of job-satisfaction

As was pointed out earlier, job-satisfaction is not the kind of phenomenon which is either absent or present (she loves me, she loves me not - Burroughs 1976) but one which can exist in varying degrees and which is therefore amenable to interval-scale measurement. This would mean that as a result of measurement it should be possible to locate different individuals along a continuum from high job-satisfaction to low job-satisfaction, and meaningfully compare differences between degrees of job-satisfaction. Additionally it should be possible to locate an individual's job-satisfaction within an empirically secured distribution of job-satisfactions, and thereby

Indeed it would be perfectly possible to derive Job-Satisfaction Quotients (JSQ's) rather like Intelligence Quotients. This would be done by translating the raw scores on to a standard scale having a mean of 100 and a standard deviation of (say) 15. The appropriate transformation would be accomplished in the present example by computing as follows:-

$$JSQ = 100 + \frac{\text{Raw Score} - 80}{10} * 15$$

The JSQ's of X, Y and Z would be 55, 100 and 130 respectively.

It has to be pointed out that in the research reported herein, the methods of data analysis which are employed are of the parametric kind which assume measurements of at least interval-scale quality. While, in the measurement of psychological variables, there is no simple way of demonstrating the interval-scale quality of test data, the assumption made here is consistent with a long tradition.

Scales of measurement of job-satisfaction have generally been of the Likert questionnaire kind, in which respondents are required to indicate their varying degrees of agreement/disagreement with a set of propositions presented to them. One typical example is the Brayfield-Rothe (1951) Index of Job-Satisfaction, in which 5-point Likert style responses to the following eighteen propositions are obtained :-

- 01 My job is like a hobby to me.
- 02 My job is usually interesting enough to keep me from getting bored.
- 03 It seems that my friends are more interested in their jobs.
- 04 I consider my job rather unpleasant.
- 05 I enjoy my work more than my leisure time.
- 06 I am often bored with my job.
- 07 I feel fairly well satisfied with my job.
- 08 Most of the time I have to force myself to go to work.
- 09 I am satisfied with my job for the time being.
- 10 I feel that my job is more interesting than others I could get.
- 11 I definitely dislike my work
- 12 I feel that I am happier in my work than most people.

- 13 Most days I am enthusiastic about my work.
- 14 Each day of work seems like it will never end.
- 15 I like my job better than the average worker does.
- 16 My job is pretty uninteresting.
- 17 I find real enjoyment in my work.
- 18 I am disappointed that I ever took this job.

This particular scale is not structured on the basis of any particular theory of job-satisfaction, nor on the face of it does it appear to cover a very broad range of work experience. Indeed nearly one third of the items (2, 3, 6, 10 and 16) are more or less the same, dealing with an evaluation along a boring/interesting dimension. In a similar way there is some repetition of questions concerning both the like/dislike and the satisfied/dissatisfied dimensions.

The difficulty in preparing a job-satisfaction scale to handle respondents from any occupation is that it is not possible to include items related to specific jobs, and which could therefore probe many facets of specific job experience. It is this problem which is probably the cause of the somewhat repetitious nature of the Brayfield-Rothe items and its limited coverage.

A more comprehensive scale of measurement of job-satisfaction is that devised by Smith (1959) and which is known as the 'Cornell Job-Description Index'. This questionnaire covers five broad areas of work experience viz. the work itself, the supervision, colleagues, pay and promotion prospects. These areas reflect Smith's conclusions concerning the most relevant factors of job-satisfaction. The items themselves require 3-point Likert style responses and are very short, often only one word long. For example, in the category 'WORK' the respondent has to indicate YES, NO or ? to such cues as 'Fascinating', 'Routine', 'Simple', 'Endless'. In the category PEOPLE (colleagues) there are items like 'slow', 'ambitious', 'easy to make enemies' and 'talk too much'. Vroom (1964) thinks very highly of the Cornell J.D.I. proclaiming that it

"is without doubt the most carefully constructed measure of job-satisfaction in existence today the extensive methodolog-

-ical work underlying this measure, as well as the available norms should ensure its widespread use both in research and practice."

Vaughn and Dunn (1972) are similarly impressed. They maintain that a job-satisfaction scale should index several dimensions of work attitude rather than an overall (global) dimension; should be applicable to a wide variety of jobs; should be sensitive to changes in attitude; should evoke co-operation (through being interesting, realistic and varied); should be reliable; should be valid; should be brief and easily scored and finally should have associated normative data available. Vaughn and Dunn (Op. cit.) feel that this Cornell J.D.I. satisfies all these criteria.

Patricia Cain Smith, the author of the Cornell J.D.I. makes the useful point that it is easier for respondents to describe their work rather than to evaluate it, so that preference is given to the inclusion of items evoking descriptive rather than evaluative responses. This difference is perhaps exemplified by the following two contrasting items which might occur in a job-satisfaction scale:

- A. Do you feel that you get on pretty well with your colleagues at work ?
- B. Have you ever lost your temper with one or more of your colleagues at work ?

Item A clearly requires judgement while item B is more inclined towards being a simple statement of fact although there is scope for judging at what point a temper is 'lost' . This 'descriptive-rather-than-evaluative' approach is embodied to a considerable extent in the job-satisfaction scales used in the present research, as will be seen later. It is assumed that job-satisfaction can be inferred from such factual/descriptive responses.

3.1 Describing Human Personality

Since the main concern of this work is the relationship between teacher personality and work attitude, it is incumbent therefore to indicate the meaning which is to be ascribed to the concept 'personality'. Many ways of systematically describing human personality have been proposed. They vary not only in their degree of scientific credibility - from the speculations of psycho-analytical theory to the empiricism of factor analysis - but also in the domain of their concern - from systems which take into consideration the whole gamut of human characteristics including attitudes, values, beliefs, interests etc., to those which attempt to focus upon a limited number of perhaps more basic aspects of personality.

Definitions of personality abound, each reflecting their author's point of view. My own definition of personality in the context of this research would be:

'those relatively enduring, non-learned characteristics of an individual which determine the unique way in which he will generally respond to experience.'

It will be noticed that aspects of individuality which are essentially the result of learning are excluded from the domain of this definition, although it is acknowledged that personality characteristics included in the domain may pre-dispose people towards the acquisition by experience of particular attitudes, interests etc. For example, it could be argued that an introverted person is pre-disposed towards acquiring interests of a solitary nature (like cross-words or gardening). While these interests are certainly part and parcel of such a person's unique individuality, they would not be of concern here - but his introverted qualities would be.

It is also noticed that the above definition refers to 'relatively enduring' characteristics. While it is certainly true that in the total sense, people's personalities are changing continually, both Eysenck (1970) and Cattell (1970), whose systems of personality description form the basis of the present research, offer evidence of the stability over time of the personality factors they describe. Stability over time of any characteristic of an organism always suggests the possibility of a genetic basis for that characteristic. Eysenck (1967) suggests that some three quarters of the variance of human personality (in terms of his own framework of description) is largely genetically determined. More recently Buss et alia (1973) provide evidence of the high heritability of four fundamental factors of human temperament viz. emotionality, activity, sociability and impulsivity. It is worth observing that both Eysenck and Cattell include all four of these temperament factors within their schemes of personality description.

One final comment upon the definition of personality given on the previous page perhaps needs to be made. This concerns the idea of ways in which people will 'generally' respond to experience. One often encounters the suggestion that people can change their personality according to the demands of the situation they find themselves in. While it may be true that an essentially, say, timid person will on occasions behave most aggressively, this does not alter his underlying timidity - his 'general' tendency to respond in a timid fashion. In the same way, one does not really alter a person's general 'domineeringness' by the simple expedient of pointing a loaded revolver at him and saying "stick-em-up! ".

It has been proposed that there are two basic approaches to the process of describing human personality. One is the so-called 'idiographic' approach, the essence of which is the consideration of the individual and his unique personality structure without reference

to any common framework of description (to which other people could be related). The disadvantage of an idiographic approach lies in the fact that it is not possible to derive or demonstrate any wide-ranging generalizations relating personality data to other data. On the other hand, the 'nomothetic' or dimensional approach, seeks to derive a systematic framework of personality description, with reference to which ANY individual's personality can be described. The power of this approach derives from the fact that generalizations relating personality to other data, can now be logically and/or empirically determined.

The basis of the nomothetic approach is the acknowledgment of the existence of a number of 'dimensions' of personality such as:-

TIMID	—————	versus	—————	BOLD
CONSERVATIVE	—————	versus	—————	RADICAL
RESERVED	—————	versus	—————	SOCIABLE
DEFERENTIAL	—————	versus	—————	DOMINEERING
TRUSTING	—————	versus	—————	SUSPICIOUS

Some aspects of an individual's personality can be expressed in terms of these dimensions by indicating his position on each of the dimensions shown. He might, for example, be a little more domineering than average, very much more suspicious than average etc. The whole point is that it is possible to propose a set of dimensions based upon personality traits of the kind shown, where each trait is defined by a polar opposite pair of adjectives, and by relating his degree of possession of the attribute in question to the average magnitude of the attribute displayed by a representative sample of the population.

Clearly, such a scheme has to cope with the problem that the possible number of personality dimensions is at first sight very large indeed, as a short time perusing a dictionary would soon show. (Allport and Odbert, 1936, at Harvard, searched the dictionary and found more than three thousand trait words describing personality.)

Furthermore, many of these dictionary derived dimensions are strongly correlated, so that knowing an individual's position on any one dimension, it is possible to predict his position on several others. It is always possible that a whole set of dimensions may all represent either essentially the same underlying trait, or closely related aspects of it. Personality theorists have had to solve the problem of finding the most economical number of broader dimensions, to which the many minor dimensions can be reduced, and which will nonetheless provide an adequately comprehensive scheme for describing human personality.

The solution to this problem is, in principle, obtained through the application of factor analysis to personality data of various kinds, derived from the whole sphere of human personality. Such data include ratings by selves and others, self-completed questionnaires, and situational tests. The factor analysis procedure isolates those factors or dimensions which are necessary to account for the variance of human personality (though it is up to the analyst to supply appropriate names for, or descriptions of, these factors).

The surprising result of the labours of various factor analysts, working from similar raw data, is the extent of the lack of agreement as to the appropriate number and nature of the dimensions required:

"the result is usually, that one gets evidence that between twelve and twenty independent factors or sources must be at work."

Cattell (1965)

"investigations all support very strongly the thesis that two orthogonal personality factors, extraversion-introversion and emotionality-stability, are omnipresent in empirical studies and analyses, and account for a large and important portion of the total variance (of human personality)....."

Eysenck (1970)

Cattell (Op. cit.) identifies sixteen measurable personality factors which he lists in order of the decreasing proportions of the variance of human personality which they account for. Eysenck (Op. cit.)

disputes Cattell's interpretation of his (Cattell's) findings and maintains that an analysis of Cattell's factors will show that they are reducible to much fewer broader personality dimensions similar to those he himself describes. Somewhat surprisingly, in the manual of the 'Sixteen Personality Factor Questionnaire', Cattell(1962) in one breath maintains the essential independence of his sixteen factors, while in the next breath describes how to combine scores from various sub-sets of the sixteen factors to yield scores on each of four (broader) second-order factors. Eysenck also can to some appear to be slightly inconsistent. While he maintains the primary importance of the two factors referred to on the previous page he admits the existence of other factors which are almost as important and sufficiently independent. These are the Psychoticism and Tough-mindedness dimensions, the second of which was used in the present research.

Since it is unlikely that there is going to be any sudden resolution of the differences between personality theorists, and even more unlikely that in the near future there will be one universally accepted scheme of personality description, it was decided to investigate teacher job-satisfaction in terms of both the Eysenck and Cattell systems. A list and brief description of each of three Eysenck factors and each of the sixteen Cattell factors which have been involved in this research is given below in Table 3.1 (more substantial descriptions are given in the appendices Table 9.2)

Table 3.1 Personality factors (dimensions) investigated in relation to teacher job-satisfaction.

Factor	Description	Factor	Description
Eysenck E	Introvert vs. Extravert	Cattell I	Tough vs. Tender-minded
Eysenck N	Stable emotions vs. Unstable	Cattell L	Trusting vs. Suspicious
Eysenck T	Tender vs. Tough Minded	Cattell M	Practical vs. Imaginative
Cattell A	Reserved vs. Outgoing	Cattell N	Forthright vs. Shrewd
Cattell B	Less vs. more Intelligent	Cattell O	Serene vs. Troubled
Cattell C	Instable vs. Stable emotions	Cattell Q ₁	Conservative vs. Liberal
Cattell E	Humble vs. Assertive	Cattell Q ₂	Dependent vs. Self-sufficient
Cattell F	Sober vs. Happy-go-lucky	Cattell Q ₃	Undisciplined vs. Controlled
Cattell G	Expedient vs. Conscientious	Cattell Q ₄	Relaxed vs. Tense
Cattell H	Shy vs. Venturesome		

3.2 Predicting Teacher Job-Satisfaction from Personality Variables

A thorough knowledge of the nature of school-teachers' work, together with an understanding of the meaning of the various personality dimensions should permit reasonably informed speculations about the likely links between personality type and work attitude. Over thirty years ago Cattell (1948) offered some hypotheses concerning the role of personality factors in teacher behaviour:

"The general clinical knowledge of cyclothyme-schizothyme tendencies suggests that the cyclothyme tendency would be favourable to teaching success. Surgency almost certainly would contribute to the ability to deal quickly with the behaviour and other problems of children.."

The dependent variable of Cattell's speculations is some notion of 'teaching success'. This is a broad concept of which job-satisfaction would doubtless be regarded as a significant element.

Kline (1975) argues enthusiastically the case for using personality scales of the Cattell or Eysenck kind in vocational counselling. While admitting his personal preference for the Cattell system, he does not offer any speculations concerning personality profiles and job-adjustment but bases his argument on the fact that Cattell scale 'norms' are available for various occupational groups. The assumption is that the more closely an individual's personality profile matches the norms of a given occupational group, the more likely he is to fit the bill. Certain assumptions are made in this line of reasoning which will be discussed subsequently.

In order to test out opinion in the area of job-satisfaction/personality-type, a poll was conducted by the present author among 25 College of Higher Education Tutors involved in teacher training. All these tutors had regularly been required to interview and judge the suitability of applicants for teacher-training courses and to make appropriate recommendations. These interviews are semi-structured in

the sense that the interviewer is supplied with a check-list which includes a number of personality factors he is required to assess. Some of these factors are somewhat vague in their meaning e.g. 'manner' and others of dubious validity such as 'poise'. Nonetheless all the tutors in the poll had regularly been required to consider personality factors in the context of an applicant's suitability. The purpose of this poll was to identify which, if any, personality factors they considered to be relevant. The criterion of relevance chosen was the likelihood that a factor would relate to job-satisfaction, and the personality factors offered for scrutiny were those used in the present research.

The form of the questionnaire supplied to those polled is given in Fig.3.1

Fig. 3.1 Personality-Type/Job-Satisfaction Questionnaire

Dear Colleague,

I wonder if you could spare a few minutes of your time by indicating your judgement on a matter connected with some work I am doing. I would like you to give me your opinion concerning the personality characteristics of people whom you believe would or do enjoy working as classroom teachers in First, Middle or Secondary schools. By 'enjoy' I mean something equivalent to the idea of 'job satisfaction'.

Since I require this information in the context of a particular framework of personality description, I am supplying a list of personality factors (dimensions) to form the basis of your reply. Each factor is described by means of a cluster of characteristics of people located at either end of a continuum. If you consider that a particular factor is important to job-satisfaction (general enjoyment of work as a classroom teacher), please write the letter F, M and S towards either end of the line representing this dimension. F, M and S refer to First, Middle and Secondary school teaching respectively. If you do not consider that a particular factor is relevant to job-satisfaction, please make no entry on the line representing this factor.

Continued overleaf

Suppose for example you were considering a factor such as Practically orientated versus Theoretically orientated, and felt that a practically orientated person rather than a theoretically orientated person would enjoy working in a First school, while the reverse applied to working in a Secondary school, and that this factor was irrelevant in the case of Middle school work, then your entries would be made as follows:

Practically Orientated F X S Theoretically Orientated

Please now deal with the following nineteen factors in the manner described above:

1. INTROVERT (Inactive, non-sociable, controlled, careful, inhibited, reflective, responsible) X EXTRAVERT (Active, sociable, risk-taking, impulsive, expressive, practical, irresponsible)

(Following at this point were descriptions in the same form of the rest of the nineteen personality factors listed in Table 3.1 and amplified in Table 9.2 in the appendices.)

.....

The results of this poll/survey are summarised by frequencies in Table 3.2 on page 39. The number of respondents endorsing each particular personality factor as being relevant to the job-satisfaction of First, Middle or Secondary school teachers is indicated under each 'Total' column. The natures of these various endorsements are indicated by the frequencies under the columns headed '+' and '-'. Entries under columns headed '+' denote the number of respondents who (a) considered the particular personality factor named in the row heading as being relevant to teacher job-satisfaction, and (b) considered that traits listed on the right hand side of the relevant personality dimension were characteristic of those securing greater job-satisfaction. Entries under the columns headed '-' show the number of respondents who considered traits

Table 3.2 Frequencies of Opinions concerning the role of
Personality Factors in Teacher Job-Satisfaction

FACTOR	FIRST			MIDDLE			SECONDARY		
	+	-	TOTAL	+	-	TOTAL	+	-	TOTAL
Eysenck E	8	5	13	9	2	11	13*	3	16
Eysenck N	0*	25	25*	0*	25	25*	0*	25	25*
Eysenck T	2*	16	18*	5	5	10	21*	0	21*
Cattell A	23*	1	24*	22*	0	22*	13	9	22*
Cattell B	8	7	15	13*	2	15	15*	1	16
Cattell C	18*	4	22*	21*	1	22*	21*	0	21*
Cattell E	4	10	14	7	4	11	13*	2	15
Cattell F	12*	3	15	10	4	14	8	8	16
Cattell G	21*	1	22*	20*	1	21*	17*	4	21*
Cattell H	16*	3	19*	17*	0	17	18*	1	19*
Cattell I	7	14	21*	2*	17	19*	0*	23	23*
Cattell L	1*	21	22*	4*	16	20*	10	10	20*
Cattell M	1*	16	17	2*	16	18*	1*	15	16
Cattell N	2*	11	13	3	10	13	9	5	14
Cattell O	0*	23	23*	0*	23	23*	0*	24	24*
Cattell Q ₁	12	7	19*	10	9	19*	10	8	18*
Cattell Q ₂	13	7	20*	16*	5	21*	19*	2	21*
Cattell Q ₃	16*	2	18*	16*	2	18*	16*	3	19*
Cattell Q ₄	1*	22	23*	0*	21	21*	1*	21	22*

* Two-tailed probability under H_0 of these frequency distributions is less than 0.05 (5%)

listed at the left hand end of each personality factor to be conducive to job-satisfaction.

Two analyses are required in order to ascertain the significance or otherwise of the various frequencies in Table 3.2. The first concerns the hypothesis that the tutors consistently judge the various personality factors as either relevant or not relevant to teacher job-satisfaction. Since there were no a priori expectations in this matter, this hypothesis is of the two-tailed variety. The corresponding null hypothesis H_0 would be that the tutors' judgements

are totally arbitrary, so that under this null hypothesis the most likely outcome is that for any factor, about as many tutors will endorse it as being relevant as dismiss it as irrelevant. The two-tailed probabilities under H_0 are determined using the 'binomial' test described in Siegel (1956) and elsewhere. The starred frequencies in each of the 'Total' columns in Table 3.2 have, in each case, a two-tailed probability under H_0 of less than 5% and accordingly H_0 is rejected in these cases in favour of the hypothesis under test, at this level of significance. It is noticed that twelve of the nineteen factors were selected as being relevant to the likely job-satisfaction of all teachers. While this might seem a rather high number, it must be pointed out that the respondents were not asked the question "how relevant?". An interesting development of this poll might have been to ask respondents to put these various factors into order of importance, although as it happens priorities are indicated to some extent by the size of the various frequencies. One interesting omission from the 'relevant' factors list is the Eysenck E (Introversion/ Extraversion) factor, despite its similarity to Cattell factors A and H which were both selected. Few differences are apparent across the school age-ranges. Perhaps the most notable is the opinion that tough-mindedness is a characteristic of people likely to be happy working in First or Secondary schools but not of teachers in Middle schools.

The second analysis of these data concerns the hypothesis that in the case of factors selected as being relevant, the respondents consistently select particular directions of correlation between job-satisfaction and the selected factors. For example, 22 respondents selected Cattell factor A (Reserved versus Outgoing) as relevant to the likely job-satisfaction of secondary school teachers. Of these 22 however, 9 felt it was better for teachers to be 'reserved' while 13

chose 'outgoing'. There is little consistency in this example, and it would be unlikely that a null hypothesis H_0 that the 'direction of correlation selected by the judges is arbitrary' could be rejected in this case. Again, since no a priori reasons for supposing particular directions of correlation have been proposed, the hypothesis of directional consistency is of the two-tailed kind. The two-tailed probabilities under H_0 of the various frequencies in the Table 3.2 columns headed '+' are again determined using the binomial test. The starred frequencies in each of the '+' columns all have a two-tailed probability under H_0 of less than 5% and accordingly H_0 is rejected in these cases in favour of the hypothesis under test at this level of significance.

A detailed inspection of Table 3.2 reveals no fewer than seventy eight predictions concerning personality factors and teacher job-satisfaction. While it is true that the detailed proof of the hypothetical pudding will lie in the empirical eating, it is clear that by and large the respondents polled here do subscribe to the general hypothesis that certain personality characteristics of people do make them more or less likely to obtain a high level of satisfaction from work with children in schools.

3.3 Job-Satisfaction and Personality Characteristics - some Research Findings.

Not a great deal of research has been carried out which looks directly at the link between degrees of job-satisfaction and the kinds of personality factor considered here. It is probably fair to suggest that the majority of research effort has been directed towards differentiating between various occupational groups in terms of selected characteristics which the researcher considers to be of importance. For example, Strong (1943, 1955) has over a long period of time studied 'interests'. Basic to his work is the assumption that

individuals are best suited to occupations whose practitioners have interest patterns similar to their own. Accordingly, Strong has identified the interest profiles characteristic of members of many occupational groups and developed his well known SVIB - the 'Strong Vocational Interest Blank'. Campbell's (1971) revision of the Strong material includes 22 interest scales and 54 occupational profiles. The logic of the SVIB is that if person A has a profile of interests similar to that of the practitioners of occupation X, then A is suitable for career X. What is uncertain is the relationship between interests and degrees of satisfaction within the occupation concerned. This question has been looked at by Schwebel (1951) who found that pharmacists with conforming interest profiles were more satisfied with their occupation than were those whose interest patterns were not appropriate. Similarly, Kates (1950) found interests to be related to overall job-satisfaction. The real value of the Strong test in vocational guidance has however been seriously questioned by Katz (1972) and by Kline (1975) for a variety of reasons.

Rather similar to the approach to vocational guidance by analysis of interests has been that through consideration of values. This approach is discussed by Super and Bohn (1971) who, for example, refer to studies in which the 'value' profiles characteristic of various occupational groups are identified. Super and Bohn (Op.cit.) maintain that

"Values, like interests, appear before occupational experience" and their assessment would seem profitable in vocational counselling. Again there seems to be the assumption that the more closely one's values approach the norms of one's occupational group, the greater the degree of work satisfaction. It is worth mentioning that in one study referred to by Super, teachers were found to value economic security more highly than other groups.

Related to values are 'needs' and the relationship between needs and job-satisfaction has also been the subject of several empirical studies. Schaffer (1953) for example, obtained measures of the strengths of needs and also of the extent to which these needs were met in a person's job. In his sample of men in higher level occupations, the strongest needs were creativity and challenge, as well as mastery, achievement and social welfare. There were significant relationships between satisfaction of the three strongest needs and overall job-satisfaction.

More relevant to this thesis is the work of Holland described by Holland (1966) and elaborated by two research reports by Holland and Whitney (1968) and Holland et al. (1969). Holland speculates about the nature of personality types and the interaction between the person and his (work) environment. Holland's theory of vocational choice rests upon four propositions:-

1. In western culture most people can be categorised into one of six personality types; realistic, intellectual, social, conventional, enterprising and artistic.
2. There are six kinds of environment corresponding to the groups.
3. People search for environments and vocations that enable them to exercise their propensities.
4. A person's behaviour is explained by the interaction between his personality and his environment.

Holland's Vocational Preference Inventory (V.P.I.) is used, rather surprisingly, as an instrument for the diagnosis of a person's personality type (in Holland's terms). While Holland's interpretations of his findings are intuitive rather than scientific, the lines along which he has worked are consistent with the spirit of the present author's work, developing as they do the idea that certain 'types' of people will suit certain 'types' of work.

Research into the use of the Cattell 16PF test in vocational guidance is summarised in the manual to the test (Cattell et al. 1970). Here can be found references to a large number of occupational profiles - mean factor scores for various groups. The more nearly a subject's scores resemble those of a given group profile, the more fit he is thought to be by Cattell for membership of that group. This is the same kind of assumption that is made by Strong (Op.cit.) in the context of interests, and by others in the case of values. Cattell (1969) shows how to assess a person's fitness for any occupation on a 7-point scale based upon a statistic known as r_p , the pattern similarity coefficient. However it needs to be remembered that the occupational fitness scale measures only the degree of similarity between a person's personality profile and that of an occupational group. What are lacking at the present stage of knowledge are data concerning the predictive validity of 'fitness' figures in terms of job success or satisfaction.

One research study which, to some extent at least, attacked the problem of the main relationship under scrutiny here is that of La Bue (1955). Using the MMPI he investigated the correlations between its various factors and a factor similar to Anticipatory job-satisfaction. La Bue attempted to discriminate between teacher-training students who showed a 'persistent' interest in teaching, and those who did not. A persistent interest in teaching was defined as completion of a teacher-training course and acceptance of a teaching position. Students at Syracuse University who applied for the course but did not enrol were said to exhibit a 'non-persistent' interest in teaching. La Bue's final sample consisted of 50 'persistent' women, 49 'non-persistent' women, 47 'persistent' men and 28 'non-persistent' men.

Several differences appeared between the two groups of women; 'persistent' women were significantly lower on the Hypochondriac,

Psychopathic Deviate, Psychasthenia, Schizophrenia, and Hypomania scales. Only one scale differentiated between the two groups of men; 'persistent' men were lower on the Psychopathic Deviate scale.

Statistically significant point biserial correlations for the total group paralleled these differences. All the correlations however, were quite small (of the order 0.25), a fact which led La Bue to conclude:

"it seems evident that the real value of the MMPI is in clinical rather than in vocational diagnosis."

La Bue is almost certainly correct, the MMPI item pool was constructed to discriminate between psychiatric groups and normals, and would not be regarded by many as a personality test at all. It is interesting to speculate as to whether La Bue would have obtained similar results with the same subjects undertaking some other kind of professional training course. One suspects that he might have done, when one examines the nature of the scales found to have predictive value.

Many other researchers have used the MMPI in the context of teacher behaviour but the majority have taken 'teaching success' as the criterion variable. These are reviewed by Getzels and Jackson in Gage (1963). Similarly, Guilford's personality scales have been used in teacher-behaviour research. Since these are factor-analytically derived scales (like Cattell's and Eysenck's) it is reassuring to those who prefer these kind to hear that:

"....results with the Guilford instruments are somewhat more consistent than those with other instruments - the MMPI for example - although the relatively small number of studies reduces considerably the possibility of conflicting findings. Interpreted at their face value, the results add support to a psychologically favourable picture of a teacher. Name a psychological 'good' - sociability, emotional stability, friendliness, good personal relations - and teachers seem to have 'more' of it than do non-teachers, and effective teachers 'more' of it than ineffective teachers." (Getzels and Jackson, Op. cit.)

Cattell's 16PF test has provided a source of predictor variables in a number of studies of the 'personality-of-the-effective-teacher variety. For example, Lamke (1951) compared the factor scores

of ten 'good' teachers with those of eight 'poor' teachers, finding significant differences on some of the scales, especially factors F and H. Lamke concluded that:

"Using Cattell's terminology for source trait F, the good teachers are more than usually talkative, cheerful, placid, frank and quick; whereas the poor teachers are below average in these respectsFor the source trait H, the good teachers are above average in their tendencies to be gregarious, adventurous, frivolous, to have abundant emotional responses, strong artistic or sentimental interests, and to be interested in the opposite sex. The poor teachers are below average in these respects."

Using a larger sample, Erickson (1954) correlated the scores of 60 teachers on parts of the 16PF test with nine different measurements of teaching effectiveness. Among the 144 correlation coefficients however, only 14 reached a 5% level of significance. Four of the factor scores yielded significant (5%) correlations with at least two of the nine effectiveness criteria. These were:

- Factor G - correlated positively with both supervisors' ($r = 0.20$) and pupils' ($r = 0.27$) ratings.
- Factor M - correlated negatively with both principals' ($r = -0.29$) and pupils' ($r = -0.28$) ratings.
- Factor O - correlated negatively with other teachers' ratings (-0.27) and with self-evaluation (-0.27).
- Factor Q_3 - correlated positively with two ratings of the principals (both $+0.28$) and with self-evaluation ($+0.38$).

Erickson's findings were partly confirmed and partly contradicted by data secured by Hadley (1954) who administered Cattell's 16PF test to the entire graduating class of a Pennsylvania teachers' college. He compared the factor scores of those receiving a teaching-practice grade A with those receiving a 'C'. Three of Cattell's factors discriminated significantly between the A and the C group. The A's scored lower on Factor F, higher on factor G, and lower on factor N. The various correlations were all of the order 0.3. Factor F (desurgency versus surgency) was found by Erickson (Op.cit.) to be positively correlated with effectiveness, in contrast with Hadley's finding.

Factor F is interesting because one might expect high surgency types to be more effective in their dealings with other people, but as Cattell (1957) points out

"The association of surgency with sociometric popularity and success in an immediate group, but with lower performance in long term 'serious' undertakings, is consistently found."

The relative smallness of the number of Cattell factors which correlate with teaching success (and the smallness of the correlations where they do) was also found by Montross (1954) who concluded that

"the Cattell 16PF test seemingly fails to identify aspects of temperamental behaviour which are related to success in teaching as measured in this investigation."

All this is not really very surprising. 'Effective teaching' is a very broad concept (few have ever convincingly defined 'teaching' let alone 'effective' teaching) and the rating methods used to assess it - often involving different raters with different subjects - are inevitably highly unreliable. Taking these two factors together - lack of precise definition and lack of reliable methods of measurement - it is not in the least surprising that clear, consistent relationships with Cattell's personality factors have not emerged.

Of considerable interest in this context are the results of the 'Teacher Characteristics Study' directed by Ryans (1960) and carried out in the United States. It is probably the single most extensive study of teachers ever carried out, and its objectives and purposes were wide ranging. Unfortunately, teacher job-satisfaction was not investigated although 'effectiveness' was. What is particularly interesting is that important factors of teacher personality were allowed to emerge from the research by analysis of a considerable body of data i.e. the predictor variables were not defined in advance, but were identified during the process of studying, among other things,

teacher effectiveness.

Three dimensions (patterns) of teacher behaviour emerged from separate factor analyses of the observational data:

Pattern X ₀	-	Warm, understanding, friendly.	versus	Aloof, egocentric, restricted.
Pattern Y ₀	-	Responsible, business- like, systematic.	versus	Evasive, unplanned, slipshod.
Pattern Z ₀	-	Stimulating, imagina- tive, surgent.	versus	Dull, routine, desurgent.

Each of these factors was found to have a part to play in teacher effectiveness although the exact functions of each factor are certainly more complex than one might expect at first sight (see Ausubel 1973). Assuming, as seems reasonable, that teacher job-satisfaction is positively correlated with effectiveness, then a comparison of the Ryans dimensions with the Cattell factors might suggest that Factors A, B, F, G, Q₁ and Q₃ might be important. Comparison with the Eysenck dimensions however, because of their broader nature, does not suggest any clear relationships (see Tables 3.1 and 9.2)

The research most similar to that presented in this thesis was that carried out by Ward and Rushton (1969) at Manchester University School of Education. Cattell personality factor scores (among other data) were obtained from 61 British Junior- and Infant-school teachers, together with measures of job-satisfaction obtained using a scale developed by Start (1966). This scale which it is claimed results in an approximately normal distribution of response is shown in Fig. 3.2 on the next page. (It is clearly a somewhat limited instrument though no doubt it is adequate for certain purposes.) The teachers involved were mostly female, and were

Fig. 3.2 Start's (1966) Job-Satisfaction Scale for Teachers

ESTIMATION OF PROFESSIONAL SATISFACTION - how satisfying do you find your job as a teacher? Try to be as honest as you can in your response. Tick the sentence which expresses your feeling most closely.

1. Most unsatisfied - definitely prefer another occupation.
2. Less satisfied than many of my colleagues.
3. As satisfied as the majority of my colleagues.
4. More satisfied than most of my colleagues.
5. Very satisfied.
6. Extremely satisfied, i.e. cannot imagine myself in any other profession.

voluntarily attending an in-service course at the School of Education. Given that teachers who attend such courses are not necessarily typical of the teaching population at large, and given also that secondary-school teachers were not represented in the sample, one has to be cautious in attempting to generalise the findings obtained. Specifically job-satisfaction correlated moderately in the sample with:

- (a) Dominance (Cattell Factor E)
 - (b) Shrewdness (Cattell Factor N)
 - (c) Untroubled Adequacy (Cattell Factor O)
- and (d) Aloofness (Cattell Factor A)

From the examples of research discussed in this section, two general conclusions emerge. The first concerns the range of personality factors which may have predictive value in the context of teaching behaviour. No fewer than twelve of Cattell's sixteen factors have been shown to be significantly related to some or other aspect of teacher behaviour. Of the four which do not appear to be involved, two of them - Factor C (emotionality) and Factor I (tough-mindedness) - are on the face of it more or less identical with two of the Eysenck dimensions, N and T, which are to be investigated. Furthermore, the other two Cattell factors not appearing (L and Q₄), would also

appear to be related to these Eysenck dimensions.

The second conclusion is that clear and consistent findings will only emerge when problems of definition, instrumentation and criterion have been effectively resolved. Only when objectively and operationally definable aspects of teacher behaviour are taken as the 'criterion' variables, is it possible to develop measurement instruments whose reliability can at least equal that of the various personality scales.

Section 4 Teacher Job-Satisfaction and Other Factors

The primary objective of the research effort recorded in this thesis is the determination and partitioning of that proportion of the variance of teacher job-satisfaction which is explained by personality factors. Nevertheless, it is not intended that the rest of the variance should remain unexplained. As will be seen, it was convenient to examine a number of other factors influencing teachers' work attitudes. These were:

- A. The nature of a teacher's activities in terms of specialist teaching, i.e. dealing with one or two school subjects only or otherwise.
- B. The sex of the teacher.
- C. The teacher's marital status.
- D. Length of service.
- E. The type of school in which the teacher works (in terms of the ages of the children taught).
- F. Academic qualifications.
- G. Salary.
- H. The teacher's status in the decision-making hierarchy of his school.

Accordingly it is appropriate to indicate the present state of opinion/knowledge about the relevance of these factors. Much of the literature in this area has been summarised and reviewed by Barrett (1975) and his general conclusions in relation to each factor are as follows:-

A. Specialisation

There was some evidence that those teachers who worked in one or two special areas of the school curriculum derived more job-satisfaction than did the 'Jack-of-all-trades' teachers. This could well be a result of their perception of there being a demand

for their specialised skills. On the other hand, specialist teachers of what might be called 'low status' subjects, e.g. housecraft, were found on occasions to believe that other teachers got more satisfaction from their work than they did. On the whole, the evidence relating job-satisfaction to specialisation was rather inconclusive.

B. Sex

Some half dozen surveys discussed by Barrett suggested higher job-satisfaction among women than among men teachers. There are inevitably many possible explanations for this finding. If teaching is generally more satisfying for those working with younger children, where there is a greater proportion of women teachers, then it is not the sex factor per se which accounts for the results. An alternative explanation is based upon the kinds of job-opportunity which exist for the different sexes in western society. Teaching may well be perceived by women as one of the higher status opportunities open to them, while the opposite perception may apply to men. As was shown in Section 2, these kinds of social perceptions do influence work attitudes. On the other hand, the sex factor alone could well be a strong influence. Only the very naive, or very hard-line women's 'libbers', would claim that there are no intrinsic genetic psychological differences between the sexes, and it may well be the case that these result in women finding working with children and young people more congenial than men do. Needless to say, the teasing out of the precise causes of this sex difference in teacher job-satisfaction represents a considerable research problem.

C. Marital Status

No consistent conclusions were reported by Barrett in this matter, although one or two interesting trends have been observed. For example, married teachers in the early stages of their career (particularly men) were more likely to have positive work

attitudes than unmarried teachers at the same career stage. This could well be the result of a desire for security of employment which young couples value in the early stages of their marriages. On the other hand, one tendency found was for married male teachers generally to experience less job-satisfaction than unmarried male teachers. This finding is possibly best explained in terms of the relationship between pay and financial commitments.

D. Length of Service

Several studies showed that length of service was positively correlated with degree of job-satisfaction. There are a host of reasons which can account for this. It can be assumed that early drop-out in the teaching profession is largely the result of some aspect of job-dissatisfaction, giving an automatic effect of biasing longer serving teachers towards higher satisfaction as a group. Additionally, salaries generally increase with length of service, confounding the issue somewhat. Moreover, as people move towards middle-age, security of employment tends to become a factor of increasing importance. There is also the fact that the longer a person has worked as a teacher, the more difficult it becomes to land any other kind of job. Human nature being what it is probably results in a great deal of rationalisation("it's quite a good job actually").

E. The ages of the children taught

Research in both Great Britain and the U.S.A. generally indicated a negative correlation between job-satisfaction and the age of the children a teacher generally works with, but as Barrett correctly points out, the differences observed may well be attributable to the effects of a variety of confounding variables.

F. The teachers' academic qualifications

No systematic differences were revealed in a number of studies reviewed. Higher qualifications tend to be associated with

specialist skills and therefore specialist teaching, but as we have seen, this factor also does not appear to relate substantially to job-satisfaction.

G. Pay

Barrett reviews many studies which suggested that job-satisfaction generally, i.e. the work attitude of the profession as a whole, was influenced by the relationship between salaries in teaching and salaries in other professions. Pay differences within the teaching profession did tend to relate to job-satisfaction (in the expected direction) but so many factors can account for this. A teacher's salary is a function of his qualifications, length of service, amount of responsibility (and hence status) etc. and each one of these factors can be assumed to have some causal influence upon work attitude.

H. Status in the decision-making hierarchy

Surprisingly, Barrett reports a paucity of conclusive evidence concerning the influence on job-satisfaction of the extent to which teachers are involved in the decision-making processes within their schools. Such involvement can derive from formal status, as when a teacher has a post of special responsibility, or from the leadership style exercised in the school in which he works. The classic studies of the influence of leadership styles made by Lewin, Lippitt and White (1939) demonstrate a general preference of people for working with 'democratic' leaders, who consult their subordinates and attempt to identify consensus views. On these bases alone, one would expect participation in decision-making and job-satisfaction to be positively associated. The situation is not however quite as simple as it might appear, as is shown by more recent work of Sadler (1970) who demonstrated (a) that preference for a 'consultative' style of leadership is by no means universal, and (b) the relationship between satisfaction and leadership style was primarily a function of

the congruence or otherwise between preferred and experienced leadership styles. Although Sadler's research was not carried out in the context of schools, the results are nevertheless most interesting.

5.1 Introduction

This research was carried out in order to explore the links between the personality characteristics of trainee teachers, and their feelings about working as teachers. These feelings, based upon their experiences on compulsory periods of supervised teaching practice, are taken as evidencing their anticipations (or expectations) of the degree of job-satisfaction they will experience in subsequent full-time teaching. There were two main phases of data collection. The first was the development and refinement of a scale of measurement of 'anticipated job-satisfaction' (A.J.S.) while the second required the securing from the trainee teachers of their various scores on the nineteen personality factors referred to earlier, and their scores on the 'refined' version of the A.J.S. scale.

The 'subjects' were students taking a one-year post-graduate certificate in Education course at a College of Higher Education. Since these were all University graduates, it is acknowledged that there are some limitations on the external validity of the results obtained. On the other hand, their backgrounds were very diverse, in that many different universities were represented together with the full range of teaching subjects. Accordingly the pool of 'subjects' could be regarded as reasonably representative of university graduates who had decided to undertake teacher training but it is not claimed that the sample involved is in the technical sense a 'random' sample.

5.2 Development of a scale of measurement of 'anticipated job-satisfaction.'

The sample approached consisted of twenty five male, and twenty five female students drawn at random from the pool of some ninety or so postgraduates attending the training course. These were

invited to respond to the 'pilot' version of the A.J.S. questionnaire shortly after they had completed the first of their compulsory supervised teaching practices. This questionnaire consisted of 50 items requiring three-point Likert-style responses, the various response modes being 'Yes', 'No' and 'Undecided'. The major difference between this scale and the kinds of job-satisfaction scales described in Section 2 is in 'test bandwidth'. Both the Brayfield-Rothe and the Cornell J.D.I., which were discussed previously, are broad bandwidth tests - necessarily so, since they are designed to assess job-satisfaction in any occupation. The tests used in the research described in this and in the next section are narrow bandwidth tests, designed specifically to assess job-satisfaction among intending and practicing school-teachers. They are not structured according to any one particular model or theory of job-satisfaction but comprise items, constructed by myself, which are designed to cover as wide a range as possible of the various job-satisfaction/dissatisfaction sources discussed in Section 2. There are of course limitations in the case of trainee teachers which do not apply in the case of the research with serving teachers which is dealt with in the next section.

A large part of the content of the items in the A.J.S. questionnaire was derived from notes made in informal conversations with students about various aspects of their teaching practice, and from a not inconsiderable fund of personal experience in this matter. As will be seen, the items are in the form of questions which vary among each other quite considerably in their locations along a 'question-of-judgement/question-of-fact continuum. It was found to be quite difficult to limit the items to questions of fact only, and any attempt to do so would have narrowed considerably the range of experiential referents. The questions are more or less equally divided between those to which the response 'Yes' indicated the greatest degree of job-satisfaction and those to which the response 'No'

showed the same thing. The complete questionnaire is given in Fig. 5.1 below in the form in which the respondents received it, except that the response grid, alluded to in the instructions, is not included. Instead, after each item, the 'scoring' response, i.e. the response which at the outset was assumed to indicate high job-satisfaction is given in parentheses.

Fig. 5.1 Pilot version of a questionnaire scale of measurement of 'anticipated job-satisfaction' for trainee teachers.

INSTRUCTIONS Here are a set of questions concerned with your feelings about various aspects of your recent teaching practice experiences. Immediately following each question, there is a key upon which you indicate your answer to the question. The way you answer each question is best based upon your first reaction, rather than upon a long drawn out thought process.

If your answer to any question is 'Yes', please put a small circle around the '+' sign following the question. If your answer is 'No', please encircle the '-' sign, while if you are undecided, and do not think you can commit yourself either way, please encircle the '?' sign. Should you wish to alter any response, please shade in your original response circle, turning it into a spot, and encircle your new choice.

There are no right or wrong answers to any of the questions, please answer as frankly as you can. Answers to individual questions are not inspected, stencil-scoring being used, and answer sheets are kept strictly confidential.

Please respond to all the following questions

01. Did you generally experience a considerable feeling of relief at the end of each lesson or teaching period for which you were responsible ? (No)
02. Did you feel that the practice made big demands upon your own special skills and abilities ? (Yes)
03. If it had been possible, would you have liked to have stayed on at your T.P. school for a few weeks beyond the official end of the practice ? (Yes)

Fig. 5.1 (continued)

04. Were there any classes or teaching activities which you got to look forward to with special anticipation because of the pleasure involved ? (Yes)
05. Did you generally feel that the children were somewhat hostile towards you ? (No)
06. Were there several children whom you dreaded having to encounter or deal with ? (No)
07. Did you find that you spent a great deal of time each evening worrying over how the next day's practice would go ? (No)
08. Were the children you taught generally eager, and interested in what you were getting them to do ? (Yes)
09. Was being the centre of attention in the classroom, a generally satisfying experience for you ? (Yes)
10. When the T.P. was over, did you have the feeling that you were just beginning to 'warm up' ? (Yes)
11. Did you find that it took you a long time to get to know the children's names ? (No)
12. Were many of the children you had to handle, really rather unpleasant ? (NO)
13. Did you find that the children you were in contact with were generally less interested in their school work than were children in your day ? (No)
14. Was it clear to you that some of the children in the groups you taught had special problems, and were in need of sympathetic and insightful handling ? (Yes)
15. Did you mostly feel that you were making a worthwhile contribution to the children's education ? (Yes)
16. Would you describe the situation of the teacher in the classroom as essentially artificial, being far removed from the real day-to-day world ? (No)
17. Did you feel that the children you taught got a degree of sympathy and understanding from you which they did not get from their regular teacher ? (Yes)
18. Were you often wondering to yourself how on earth you had got yourself into the situation you were in ? (No)
19. Did you come to feel that the regular teachers in your T.P. school fussed over petty matters to an unnecessary degree ? (No)
20. Did you often find that you were having to behave in ways that were basically unnatural to you ? (No)
21. As a result of your T.P. experience, did you start to feel that compulsory education for all children might not necessarily be such a good idea after all ? (No)
22. Are you now feeling that teaching is a job which you will find to be generally satisfying once you have become experienced ? (Yes)
23. Would you recommend school-teaching to a university graduate who was unsure what employment to take up ? (Yes)
24. Did you find the regular teaching staff of your T.P. school to be mostly rather dull and uninspiring people ? (No)

Fig. 5.1 (continued)

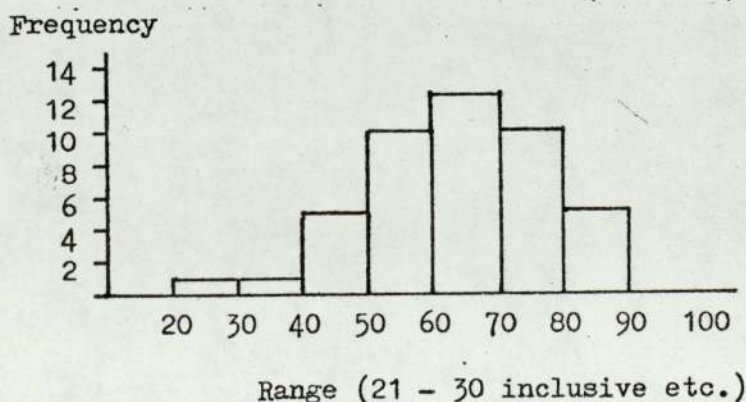
25. Did you come to the conclusion that the majority of the pupils placed little value upon school and school-work ? (No)
26. Do you currently feel that teachers are much more than little cogs in big machines ? (Yes)
27. Did you mostly feel that you could identify yourself with the values and attitudes of the permanent teaching staff at your T.P. school ? (Yes)
28. Did you find that having to be in certain definite places at certain definite times was somewhat irksome ? (No)
29. As the time for starting each of your lessons drew nearer, did you find yourself getting progressively more anxious or worried ? (No)
30. Did you feel that a substantial revision of the methods and organization of your T.P. school was long overdue ? (No)
31. Did you frequently have the feeling that you were wasting your talents and abilities while on T.P. ? (No)
32. Did you feel that you had a lot to offer the pupils which was of considerable educational value ? (Yes)
33. Did you get the impression that the staff of your T.P. school were mostly respected and valued by the pupils ? (Yes)
34. However well you did in your T.P. school, did you often feel that you would probably be managing better in some other school ? (No)
35. Did you mostly feel that the children you taught, accepted and valued the work you did with them ? (Yes)
36. From your experience of the regular staff of your T.P. school, did you decide that in some respects you could show some of them a thing or two about effective teaching ? (Yes)
37. Did the lessons or teaching periods which you took charge of mostly seem to pass quickly, so that you were often 'caught out' by the bell ? (Yes)
38. Did the children you taught frequently express disappointment when the bell (or its equivalent) went for the end of your lessons with them ? (Yes)
39. If formal education were abolished tomorrow, so that school-teaching as a profession ceased to exist, would you be sorry about having to contemplate an alternative type of work ? (Yes)
40. If the prospective material rewards of full-time school-teaching were suddenly reduced, would you be considerably deterred from contemplating teaching as your permanent career ? (No)
41. Did you get the impression that the permanent staff of your T.P. school were subject to an excessive number of petty and unnecessary restrictions during the working day ? (No)
42. Were there several members of the permanent staff of your T.P. school whose abilities and skills you came to admire ? (Yes)
43. Did you enjoy telling of each day's T.P. experience to your college colleagues or other people each evening ? (Yes)

Fig. 5.1 (continued)

44. Were there a large number of incidents on your T.P. which you would rather forget, and would prefer not to discuss with other people ? (No)
45. Were you glad to leave your T.P. school at the end of the practice ? (No)
46. Are you of the opinion that 'academics' have an important role in the education system of this country ? (Yes)
47. Did you find yourself worrying unduly over how the permanent staff of your T.P. school felt about your performance in class ? (No)
48. Did the large amount of time teachers in the staff-room spend 'talking shop' strike you as being somewhat tedious ? (No)
49. Did you find having to 'discipline' children somewhat distasteful ? (No)
50. Are you contemplating your next T.P. with considerable enthusiasm?(Yes)

Of the 50 students approached, 44 satisfactorily completed the questionnaire. Their raw numerical scores on a scale of 'Anticipated Job-Satisfaction' were derived by allocating two points for each 'scoring' response (i.e. for 'Yes' or 'No' according to the item) and one point for each 'Undecided' response. This resulted in a set of scores on a numerical scale from 0 to 100. In the event, the scores covered the range 25 - 88 and the distribution of the raw A.J.S. scores so obtained is shown in the Histogram in Fig. 5.2 below.

Fig. 5.2 Distribution of raw 'anticipated job-satisfaction' scores of 44 postgraduate trainee teachers.



It is apparent by inspection that this distribution does not depart significantly from normality, but as always, it is impossible to decide whether this represents a property of the test itself, or of the underlying variable it measures. In any event it is necessary to examine the individual items of the scale in order to assess their internal validity. An item possesses internal validity if the responses to it correlate positively with responses to the test as a whole. The purpose of the item analysis described below is to identify those items which best contribute to the measurement of the factor in question, and to eliminate those items which for various reasons make little contribution.

Generally item analysis procedures result in two kinds of index for any item. The first is an index of item 'difficulty'. Of course, the concept of difficulty is usually associated with the kinds of items appearing in I.Q. scales or in educational attainment tests, but it does have meaning in the present context. A difficult A.J.S. scale item would be one which it is hard to say 'Yes' to. Specifically, item difficulty is shown by the smallness of the number of respondents who answer 'Yes' to an item for which 'Yes' is the 'scoring' response. The second is an index of item 'discriminating' power - in the present context the ability of the item to differentiate between respondents displaying different degrees of anticipated job-satisfaction. It is well known that items which discriminate well, are inevitably of average level of difficulty. While a range of item difficulty is desirable in many scales (eg. scales of educational attainment), for the present purpose the criterion of item selection is its discriminating power.

The method used here for determining discrimination indices is the 'upper and lower thirds' procedure. The essence of the method is to identify a high-scoring group and a low-scoring group on the basis of the total pilot test scores. Ideally, each group should

comprise one third of the respondents, though this is not absolutely necessary. Next, one finds the mean scores on each item obtained by each of the two groups. The difference between these two means is the index of discrimination for that item. For the purpose of comparing the discriminating powers of the various items, it is not even necessary to determine means - the difference between the total scores on each item obtained by the high and low scoring groups is an adequate basis for comparison. In the present case, the total of scores for each item obtained by the 14 highest-scoring respondents was compared with that obtained by the 14 lowest-scoring. For example, 13 of the high-scoring group replied 'No' to item 24 while the other responded 'Yes'. Since 'No' was the scoring response, the total score gained by the 'high' group is 26 (i.e. $2*13 + 1*0$). Of the low-scoring group, only 3 gave the answer 'No', 2 were undecided and the other 9 replied 'Yes'. Thus the total score on item 24 for the 'low' group was 8, made up by $3*2 + 2*1 + 9*0$. The index of discrimination for this item is therefore $(26 - 8)$ i.e. 18. This was in fact the second highest index obtained. In Table 5.1 on the next page, the various indices obtained by this method are shown for comparison.

The maximum and minimum possible values of any index are +28 and -28 respectively. Negative indices show items which might be usable if the direction of the scoring were altered (i.e. 'No' for example becomes the 'scoring' response rather than 'Yes') though this would only be the case if the numerical sizes of the indices were comparable with those of the other usable items. In the event, the largest negative index obtained was -4 on item 37. This item, like item 02 (index +4), contributes practically nothing to the scale as a whole, and both items are clear candidates for elimination from the item pool.

Item 45 (Were you glad to leave your T.P. school at the end of the practice ?) produced the highest discrimination index (+19)

Table 5.1 Discrimination indices of the items of the pilot version of the A.J.S. scale for trainee teachers

Item	Index	Item	Index	Item	Index	Item	Index	Item	Index
01	+08	11	+04	21	+12	31	+13	41	+11
02	+04	12	+03	22	+06	32	+08	42	0
03	+17	13	+15	23	0	33	+11	43	+05
04	+02	14	+03	24	+18	34	+16	44	+07
05	+05	15	+05	25	+11	35	+08	45	+19
06	+04	16	+08	26	+13	36	-01	46	+09
07	-02	17	+01	27	+09	37	-04	47	+08
08	+06	18	+13	28	+14	38	+01	48	+12
09	+06	19	+07	29	+07	39	+15	49	+11
10	+07	20	+18	30	+13	40	+12	50	+09

with items 24 and 20 coming a very close second equal (+18 in each case). One of the dangers of test construction is that it is possible to produce a test whose items all have very high discrimination indices by simply asking what amounts to the same question over and over again through slight variations of the wording. Such a practice narrows the breadth of coverage of the scale and results in a 'bloated specific' as Cattell (1977) would call it. While there is a slight danger of this happening here by the inclusion of both items 45 and 03 for example (and inspection may suggest other cases) it was decided to derive the final working version of the A.J.S. scale by using, with some very minor rewording here and there, the thirty most discriminating items from the fifty in the pilot version. These most 'diagnostic' items are listed in Fig. 5.3 on the next page, with indications of alterations made to the original wording where this applies. The instructions supplied to the respondents of the final version of the A.J.S. scale were to be more or less the same as in the pilot version except that the respondents were asked to decide their

answers with reference to all of their compulsory periods of teaching practice. (This final version was answered by the students a few days after having returned to college from their final teaching practice.)

Fig. 5.3 Questionnaire items in the refined (working) version of a scale of 'anticipated job-satisfaction' for students completing a teacher-training course.

Reference numbers of items employed in final scale:

(See Fig. 5.1, pp.58-61)

01, 03, 10, 13, 16, 18, 19, 20, 21, 24,
25, 26, 27, 28, 29, 30, 31, 32, 33, 34,
35, 39, 40, 41, 44, 45, 46, 47, 48, 49.

Alterations to the original wording:

Relevant plural forms were used in items:

03, 10, 19, 21, 24, 27,
30, 33, 34, 41, 44, 47.

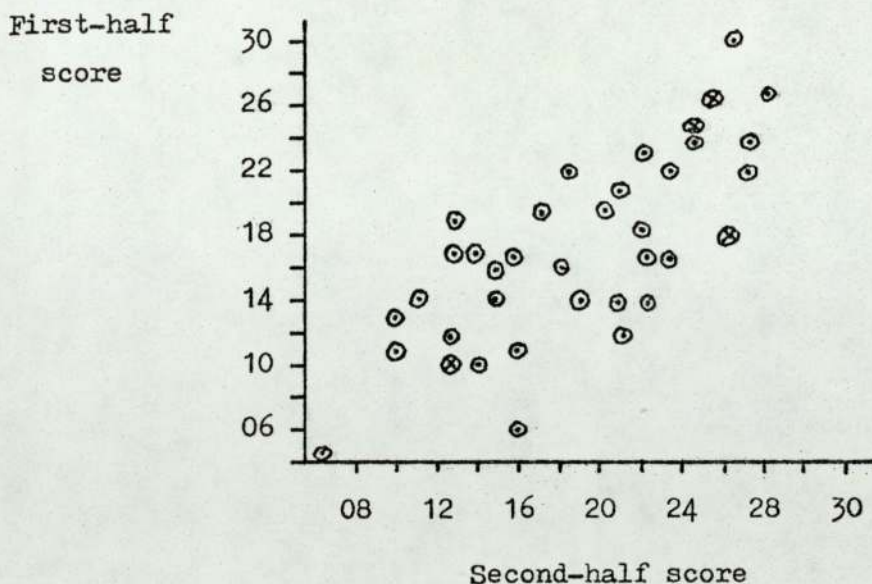
Item 45 (in the pilot scale) was reworded:

'Were you generally glad to leave
each T.P. school at the end of
the practice?'

The reliability of this final version of the A.J.S. scale can be estimated from the data obtained using the pilot version. Of the various means of obtaining a reliability coefficient for a test, i.e. test/retest, parallel forms or split-half, the latter is the only convenient one here. The 'split-half' reliability coefficient of a test consisting of a number of discrete items, is simply the coefficient of correlation between the scores derived from one half of the test items and the scores derived from the other half of the items. In order to obtain this coefficient from the responses of students to

the pilot version of the A.J.S. questionnaire, the total scores for each original respondent were found for the first and second subsets of 15 items each, of the 30 items identified for use in the final version of the A.J.S. questionnaire. Of course, many possible subsets could be used (the odd and even numbered items are commonly used in the case of tests whose items are ordered with respect to increasing difficulty level) but the first and second halves of the final working version of the A.J.S. scale are as good a choice of subsets as any. These half-test scores for 42 of the original respondents are shown in Table 9.3 in the appendices. The correlation between these half-test scores is illustrated in Fig. 5.4 below.

Fig. 5.4 Scatter diagram showing relationship between the scores of 42 subjects on the first and second halves of the working version of the A.J.S. scale.



It is clear from the scatter diagram that a substantial positive correlation exists between the two sets of scores. The magnitude of the Pearson product-moment correlation coefficient obtained from these data is $+ 0.7385$. This figure represents a split-half reliability coefficient of a magnitude which is more than

comparable with that of other attitude scales. In practice, the split-half reliability coefficient is an underestimate of the reliability of the complete test (longer tests are generally more reliable than shorter ones), and an estimate of the reliability coefficient r_f of the full test, can be obtained from a knowledge of the split-half coefficient $r_{\frac{1}{2}}$, already obtained, using the well known 'Spearman-Brown' formula:

$$r_f = \frac{2 * r_{\frac{1}{2}}}{1 + r_{\frac{1}{2}}}$$

In the present case the estimated reliability coefficient of the final working version of the A.J.S. questionnaire, r_{AJS} , will be given by:

$$r_{AJS} = \frac{2 * 0.7385}{1 + 0.7385}$$

This gives a reliability coefficient for the refined version of the A.J.S. scale of magnitude + 0.850, which is a very respectable figure indeed, approaching a magnitude typical of well constructed cognitive tests.

5.3 Investigation of the relationship between the personality characteristics of trainee teachers and 'anticipated job-satisfaction.'

The second and main phase of the research with the post-graduate students involved the collection of personality data in addition to 'anticipated job-satisfaction' data. To this end, the same sample of 50 students who had been approached earlier in their course were invited, during the last week of their course (when they were back in college and had completed all their teaching practices and other study assignments) to respond to various questionnaires

as follows:



(a) The Eysenck scales of measurement of three personality factors viz. Extraversion, Neuroticism and Tough-Mindedness, published by Eysenck and Wilson (1975)

(b) Form A of the Cattell et al. (1970) 16PF questionnaire

(c) The refined version of the A.J.S. questionnaire described above.

Each student attended, at his convenience, one of five 'testing' sessions which were arranged, provision being made for ensuring their anonymity. Of the 50 students invited, 38 (18 male, 20 female) attended one or other of the sessions although one of the men did not manage to complete the Cattell questionnaire. The raw scores for each respondent on each of the 19 personality dimensions and on the A.J.S. scale are given in Table 9.3.2 in the appendices. The means and standard deviations of each variable are given in Table 5.2 together with the corresponding values observed in the general adult population, where available. The research sample statistics are based upon the data obtained from the 37 respondents who completed all the questionnaires. Inspection of the entries in Table 5.2 reveals that for the most part there are no substantial differences between the personality characteristics of the sample and the general adult population. One notable exception is the Cattell Factor B, where the sample mean is more than one standard deviation above the general population mean. This is not surprising since Cattell B is an Intelligence scale.

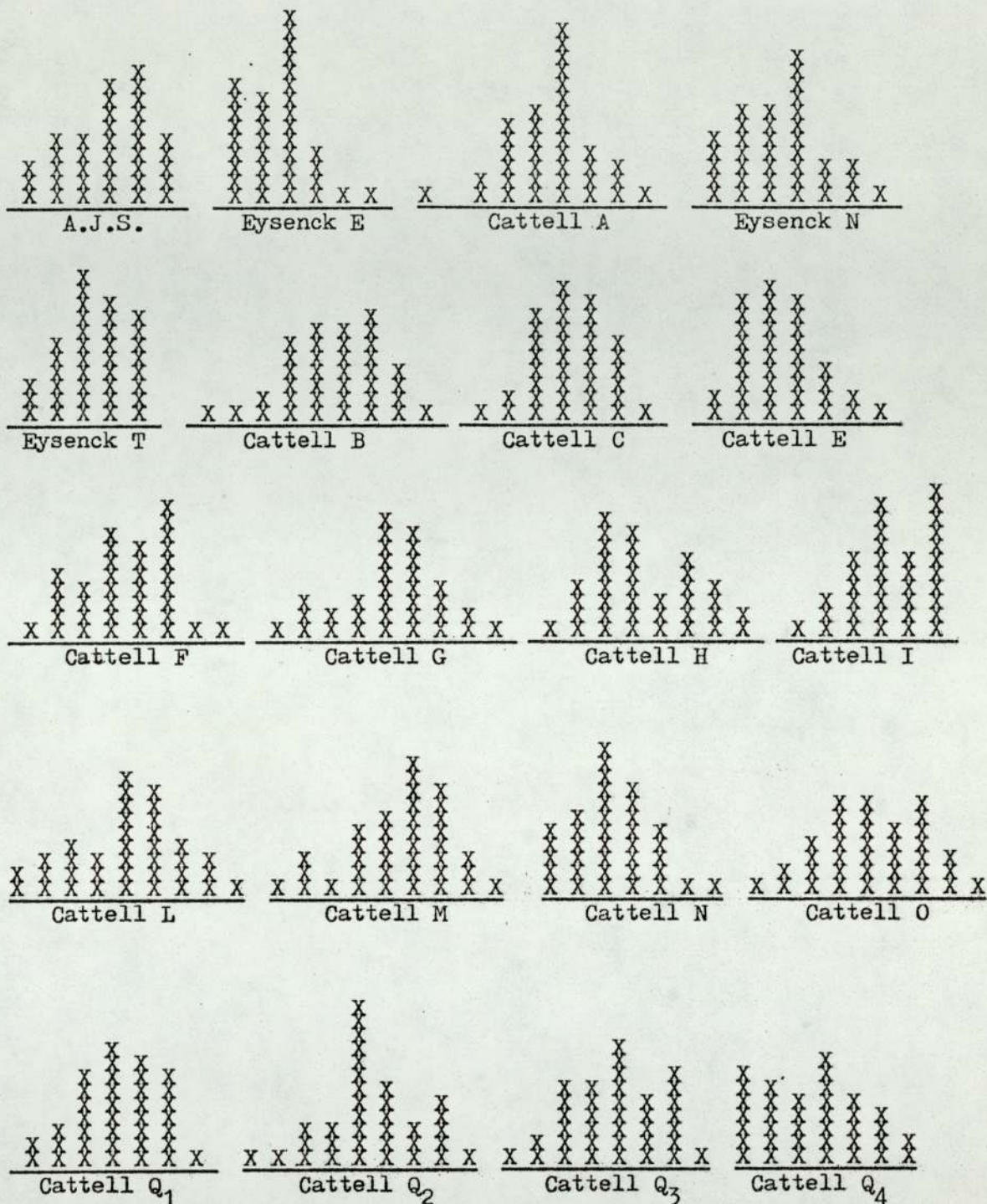
The form of the distribution of the raw scores for each factor is shown in the series of histograms in Fig. 5.5, where it can be seen that in the majority of cases there are quite clearly no serious departures from normality. There is a certain rectangularity in the distribution of Cattell Q_4 and mild degrees of skew in some of the other factors. None of these departures from normality is sufficiently serious to preclude the use of parametric analyses or to have either inflationary or deflationary effects upon the various intercorrelations.

Table 5.2 Means and standard deviations of the scores of N = 37
trainee teachers on scales of nineteen personality
factors and on the A.J.S. scale.

Factor	Research Sample		General Population	
	Mean	S.D.	Mean	S.D.
A.J.S.	37.6	8.8	-	-
Eysenck E	193	38	211	-
Eysenck N	116	45	127	-
Eysenck T	179	39	193	-
Cattell A	10.5	3.2	10.2	3.1
Cattell B	09.6	1.8	07.0	2.1
Cattell C	15.7	4.0	14.6	3.9
Cattell E	13.2	4.2	10.9	4.4
Cattell F	14.2	4.7	12.4	5.0
Cattell G	10.9	3.6	12.3	3.6
Cattell H	14.3	5.7	12.5	5.5
Cattell I	12.9	4.1	11.3	3.8
Cattell L	07.8	4.0	08.3	3.4
Cattell M	15.2	3.5	12.0	3.6
Cattell N	08.9	3.0	11.2	3.2
Cattell O	08.8	3.7	11.4	4.3
Cattell Q ₁	09.7	3.1	09.1	3.3
Cattell Q ₂	12.4	3.5	11.5	3.5
Cattell Q ₃	11.2	3.5	12.4	3.2
Cattell Q ₄	12.4	5.8	13.2	4.9

Source of general population data: Saville (19720
Eysenck et al (1975)

Fig. 5.5 Distribution of the scores of N = 37 trainee teachers on scales of nineteen personality factors and A.J.S.



The main interest of the analysis of this data lies in the correlation between the criterion variable (anticipated job-satisfaction) and the predictor variables (the personality factors). It is necessary to examine the form of the relationship between the criterion and each predictor, since simple product-moment correlations only

express the magnitude of linear regression relationships, and do not reveal curvilinear regressions. Accordingly, scatter-diagrams illustrating the relation between the criterion and each predictor were prepared from the data in Table 9.3.2 and an examination of these suggested no strong relationship of any form between the criterion and any of the predictors. The extent of what linear regression does exist in each case is shown by the product-moment correlation coefficients between A.J.S. and each of the personality factors. These coefficients are listed in Table 5.3 below.

Table 5.3 Simple product-moment coefficients of correlation between A.J.S. and each of 19 personality factors.

Factor	Correlation	Factor	Correlation	Factor	Correlation
Eysenck E	-0.055	Cattell F	-0.080	Cattell O	-0.071
Eysenck N	-0.227	Cattell G	-0.117	Cattell Q ₁	-0.015
Eysenck T	-0.124	Cattell H	-0.135	Cattell Q ₂	-0.044
Cattell A	+0.096	Cattell I	-0.145	Cattell Q ₃	+0.133
Cattell B	+0.070	Cattell L	-0.044	Cattell Q ₄	+0.121
Cattell C	+0.042	Cattell M	+0.031	-	-
Cattell E	-0.072	Cattell N	+0.127	-	-

The 5% two-tailed critical value of the Pearson product-moment correlation coefficient listed by Morris (1974) is, with 35 degrees of freedom, 0.325 . This means that under null hypotheses of no relationship between the criterion variable and any of the predictor variables, the probability of obtaining coefficients of the magnitudes in table 5.3 by chance sampling error, is in all cases greater than 0.05 . Accordingly there is no basis for rejecting the null hypothesis in any of the cases.

While none of the predictor variables correlate separately to any significant extent with the criterion variable, there remains the possibility that several predictors in appropriate combination

may do so. In the single-predictor situation, values of the dependant variable (the criterion) can be predicted from values of the independent variable (the predictor) by means of a regression equation having the general form:

$$\hat{y} = a + b_*x$$

in which a and b are constants, x is the magnitude of the predictor variable and \hat{y} is the predicted magnitude of the criterion. The values of the constants a and b can be obtained from observed values of the criterion and the predictor. The correlation between predicted and observed values of the criterion is identical with the correlation between observed values of predictor and criterion.

In the case of multiple correlation, there are several predictors (x_1, x_2, x_3 etc.) and the regression equation has the general form:

$$\hat{y} = a + b_{1*}x_1 + b_{2*}x_2 + b_{3*}x_3 \text{ etc.}$$

in which x_1, x_2, x_3 etc. are the magnitudes of the various predictor variables, and b_1, b_2, b_3 etc. are regression coefficients which appropriately 'weight' the various predictors. The correlation between observed values of the criterion variable y , and values \hat{y} predicted by the multiple regression equation is the multiple-correlation coefficient. It can happen that significant multiple correlation exists even when no significant simple correlation exists.

The magnitudes of the constant ' a ' and of the various ' b ' coefficients can be obtained from observed values of the criterion and the various predictors by the standard methods of multiple regression analysis described in various texts e.g. Moroney (1951) or Guilford (1956). The calculation procedures are however long and tedious but fortunately computer programmes are available (such as the S.P.S.S. -- Statistical Package for the Social Sciences) which permit rapid execution of the relevant calculations. Using the data under

discussion here, two multiple regression analyses were carried out. The first of these used the Eysenck factors as predictors of the criterion (A.J.S.), while the second used the 16 Cattell factors. The first analysis yielded, as a primary result, the following matrix of intercorrelations among the criterion and the predictors:

Table 5.4 Intercorrelations between scores on A.J.S. and on three Eysenck personality factors of N = 37 trainee teachers.

Factor	A.J.S.	Eysenck E	Eysenck N	Eysenck T
A.J.S.	+1.00	-0.055	-0.227	-0.124
Eysenck E	-	+1.000	-0.167	+0.215
Eysenck N	-	-	+1.000	+0.371
Eysenck T	-	-	-	+1.000

Of interest here is the significant correlation between the Eysenck N and T factors. (The 5% 2-tailed significant product-moment correlation coefficient at 35 degrees of freedom is 0.325).

The multiple regression equation obtained from these intercorrelations is:-

$$\hat{A.J.S.} = 47.6 - 0.021_*E - 0.046_*N - 0.004_*T$$

in which $\hat{A.J.S.}$ stands for a predicted value of 'anticipated job-satisfaction' derived from raw scores on each Eysenck personality factor scale. ('E' in the equation means 'raw score' on the scale used to measure the Eysenck Extraversion factor etc.)

The general smallness of the various regression ('b') coefficients in the equation is a clear indication of the weak relationship between job-satisfaction and the Eysenck personality factors. The standard error in predicted values of A.J.S. in this case is 8.9 (to 2 significant figures). This means that when the prediction equation is used to obtain an A.J.S. value from given

values of E, N and T, then the true value will lie within 2×8.9 i.e. within about 18 points of the predicted value on 95% of occasions. (This much on an A.J.S. scale of range only 60 points !)

The correlation between observed A.J.S. values and values predicted by the regression equation i.e. the Multiple Correlation Coefficient is of magnitude $+0.247$, which fails to reach the 5% 2-tailed critical value with 33 d.f. and 4 variables of 0.460 as given in Guilford (1956). Had the observed multiple correlation coefficient been significant (which would have been the case had the sample been larger and the observed coefficient the same) it would have best been interpreted by its square i.e. 0.247^2 or 0.061. This represents the fraction of the variance of A.J.S. scores which is accounted for by the Eysenck personality factors - some 6% !

The second multiple regression analysis, in which the 16 Cattell factors are the predictors, yielded the matrix of correlation coefficients shown in Table 9.3.3 in the appendices. With so many correlations (136) being computed, it is not surprising that so many are statistically significant - equalling or exceeding a 5% significance value of 0.325. Whenever the 5% level of significance is chosen it is understood that a Type I error (wrongly rejecting the null hypothesis) is likely to be made once in each twenty occasions of judgement. Despite this, several of the intercorrelations between respondents scores on the Cattell factors are not only (statistically) significant but also substantial - over 50% common variance is observed in several instances. The regression coefficients 'b' for the various Cattell factors are shown in Table 5.5 overleaf. The 'constant' in the regression equation is 29.9 so that predicted values of A.J.S. are obtained from Cattell factor scores using:

$$\widehat{A.J.S.} = 29.9 - 0.68 \times A + \dots + 1.01 \times Q_4$$

with a standard error in predicted A.J.S. of 10.1. The magnitude of the multiple correlation coefficient, i.e. the product-moment

Table 5.5 Regression coefficients for 16 Cattell factors

Factor	A	B	C	E	F	G	H	I
Coefficient	-0.68	-1.64	+0.98	+0.08	-0.04	-0.76	-0.11	-0.80
Factor	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
Coefficient	+0.30	+0.50	+0.62	-0.39	+0.48	-0.73	+1.33	+1.01

correlation between observed values of A.J.S. and values predicted from the regression equation is +0.521 . The 2-tailed 5% critical value of the Pearson product-moment correlation coefficient with 20 degrees of freedom and 17 variables, obtained by interpolation from Guilford (Op.cit.) is 0.792 . Accordingly the probability under the null hypothesis of no association between criterion and predictors exceeds 5% and there is therefore no basis for rejecting the null hypothesis. (Again the comment can be made that had the figure of +0.521 for the multiple correlation coefficient been significant, then over 25% of the variance of A.J.S. would be explained by the Cattell factors).

The main conclusion from this study of teachers in training is that it is not possible to predict the degree of job-satisfaction they anticipate deriving from permanent employment, on the basis of personality data of the kind used here. The observed variance in A.J.S. is not accounted for by these personality factors but by other factors. The nature of these will be the subject of later discussion after the research with serving teachers has been described.

6.1 Introduction

As stated previously, the main research concerned the links between the job-satisfaction experienced by serving teachers, personality factors and the other factors discussed earlier. For this purpose 'serving teachers' were defined as qualified teachers currently working in infant, junior or secondary schools, having had a minimum of one year's full-time experience, and regularly involved in class or subject teaching. (Head teachers and non-teaching deputies were excluded from the population under scrutiny).

In principle there were three main phases to this work:

Phase A - the preparation, development, pilotage and refinement of a scale of measurement of teacher job-satisfaction,

Phase B - the collection of job-satisfaction data together with 'other factor' data (using a refined version of the job-satisfaction scale) from a suitable sample of serving teachers,

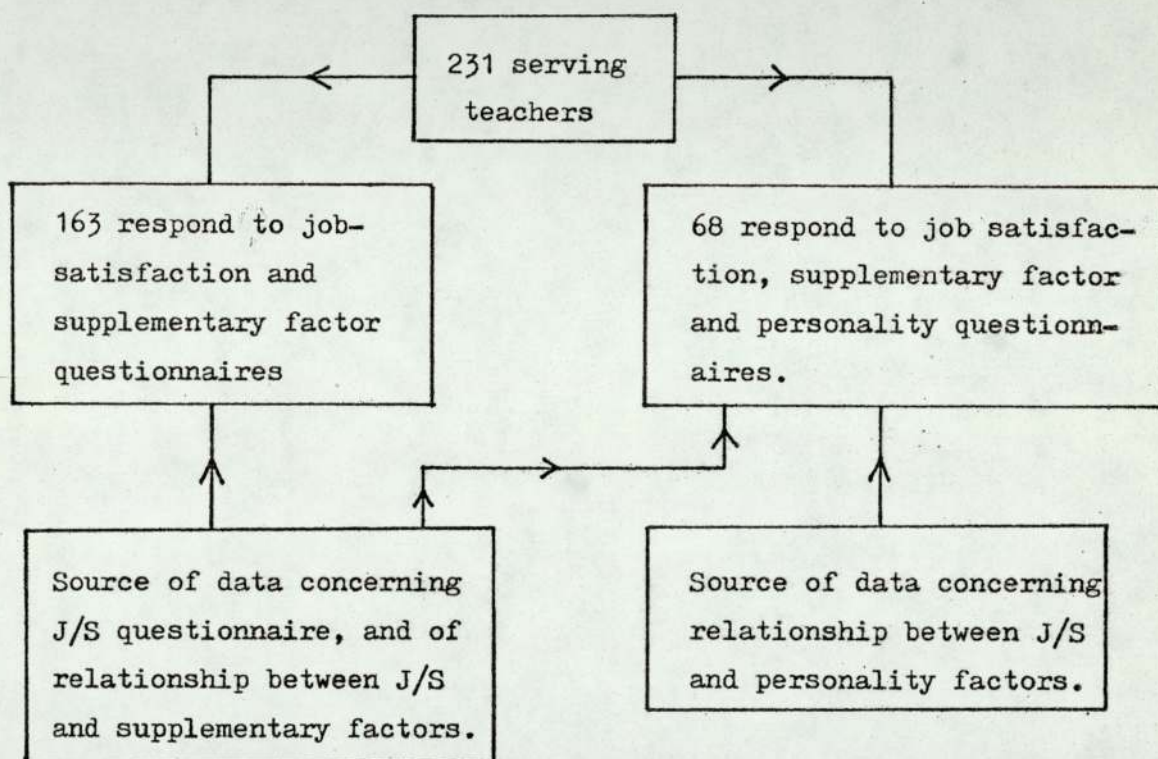
Phase C - the collection of job-satisfaction and personality data from a suitable sample of serving teachers.

In practice, these three phases were conducted simultaneously by the methods described shortly, though it is convenient to describe them as separate procedures and to analyse the results of each phase separately.

The first phase (A) required the production and pilotage of a job-satisfaction questionnaire for serving teachers. This was combined with the second phase (B) by using the pilot-respondents as the research sample for Phase B after rescoring the original questionnaires, and by including with the pilot J/S questionnaire a set of 'supplementary' questions referring to the various factors discussed in Section 4 (sex, length of service, pay, school type etc.) Phase C was effected by obtaining responses from a sub-set of the Phase B

sample to the personality questionnaires. The analysis in Phase C, of the relationship between personality and job-satisfaction was based upon rescored J/S questionnaires. In point of fact, 231 teachers responded to the pilot J/S questionnaire and to the supplementary questions, while 68 of these completed, in addition, the personality questionnaires. The data-collection procedures involved are illustrated in Fig. 6.1 below.

Fig. 6.1 Research with serving teachers - data collection scheme



The pool (population) of serving teachers from which the various samples were drawn, consisted of colleagues of teachers attending a three year part-time B.Ed. degree course at a College of Higher Education in the West Midlands Region. The method of drawing the samples was as follows:

- (1) From the list of schools represented by Year 2 students on the part-time degree course, 7 First, 10 Middle and 13 Secondary schools were selected at random. The students from these schools

were contacted and asked to secure, if possible, the co-operation in each case of a random selection of three of their colleagues for the purpose of responding to the pilot job-satisfaction (J/S) questionnaire, the supplementary questions and the personality questionnaires. The distribution of schools of various kinds in this sample approximates fairly closely to the distribution of teachers as they exist in various types of school. None of the school representatives approached refused the request though several were not confident about being able to obtain the co-operation of their selected colleagues. In the event, completed response packages were obtained from 68 of the 90 teachers approached. This represented a response rate, for this phase of data collection, of some 75%.

(2) From the list of schools represented by year 1 and 3 students (but not by year 2 students involved in the first sampling operation), 14 First, 20 Middle and 26 Secondary schools were selected at random. The students from these schools were, in the same way as described previously, invited to ask, in each case, 3 randomly selected colleagues to complete the pilot J/S questionnaire and supplementary questionnaire. In principle, 180 teachers were invited to complete these questionnaires and the 163 which were returned duly completed indicated a response rate of over 90%.

It would be ambitious to claim that the samples involved were in the strict sense genuinely random. The pool of schools was limited by the circumstances described, and while the teacher-couriers all gave the impression that they had followed the required colleague-selection procedure to the letter, there was no way of knowing whether they had in fact done so. Nevertheless, the sample is respectably large and there is abundant evidence that a wide range existed for every factor measured,

6.2 Research Phase A - development of a questionnaire scale of job-satisfaction for serving teachers.

6.2.1 Preparation of the Pilot version of the scale

The scale comprised 76 items requiring 3-point 'Likert' style responses, the various response modes being 'Yes', 'No' and 'Undecided'. The items were constructed by the author and were designed to explore the full range of sources of job-satisfaction/dissatisfaction discussed in Section 2. No particular model of job-satisfaction was assumed in the construction of the scale - an empirical approach was adopted in the sense that while the various theories are all fairly well represented by the scale items, the acid test of the suitability of any specific item was going to be the item analysis procedure described later. While a number of the items were rewritten versions of some of the items in the A.J.S questionnaire for trainee teachers, there is naturally much greater scope for exploration of job-satisfaction among serving teachers and this is reflected in the greater length of this scale. As in the case of the A.J.S. questionnaire, much of the content of the items for serving teachers was derived from notes made in informal conversations with teachers about various aspects of their work and from considerable personal experience in this matter. Also as in the case of the A.J.S. scale, the items are in the form of questions which vary among each other in their locations on a 'question of judgement/question of fact' continuum and are more or less equally divided between those to which a 'Yes' response showed high job-satisfaction and those to which a 'No' response showed the same thing. The complete scale is given in Fig.6.2 in the form in which respondents received it except that the response grid alluded to in the 'Instructions' is omitted, and after each item the 'scoring' response (i.e. the response which was assumed to show high job-satisfaction) is given.

Fig. 6.2 Pilot version of a questionnaire scale of measurement of job-satisfaction for serving teachers.

Instructions

Here are a set of questions concerned with your feelings about various aspects of your work as a teacher. Immediately following each question there is a key upon which you indicate your answer to the question. If your answer to any question is 'Yes', please put a small circle around the '+' sign following the question. If your answer is 'No' please encircle the '-' sign, while if you are undecided and do not feel you can commit yourself either way, please encircle the '?' sign. Should you wish to alter any response, please shade in your original response circle, turning it into a spot, and encircle your new choice. The way you answer each question is best based upon your first reaction, rather than upon a long drawn out thought process. There are no right or wrong answers to these questions, please answer as frankly as you can. Answer sheets are kept strictly confidential.

Please respond to all the following questions

- 01 Do you generally experience a feeling of relief at the end of each lesson or teaching period for which you are responsible ? (No)
- 02 Do you feel that your work makes big demands upon your special skills and abilities ? (Yes)
- 03 Are there many classes or teaching activities which you generally look forward to because of the personal pleasure you derive ? (Yes)
- 04 Do you often feel that the children you teach are somewhat hostile towards you ? (No)
- 05 Does your work bring you in contact with several children whom you dread having to encounter or deal with ? (No)
- 06 Do you find that you spend a great deal of time each evening worrying about your next day's teaching ? (No)
- 07 Are the children you teach generally eager and interested in the work you do with them ? (Yes)

Fig. 6.2 continued

- 08 Do you find that being the centre of interest in the classroom is a generally satisfying experience ? (Yes)
- 09 Do you find that you get to know children's names quite quickly ? (Yes)
- 10 Are many of the children you have to deal with really rather unpleasant ? (No)
- 11 Do you find that the children you teach are generally less interested in their school work than were children in your day ? (No)
- 12 Is it clear to you that some of the children you teach have special problems, and are in real need of sympathetic and insightful handling ? (Yes)
- 13 Do you mostly feel that you are making a worthwhile contribution to your pupils' education ? (Yes)
- 14 Do you feel that the children you teach get a degree of sympathy and understanding from you, which they might not get from other teachers ? (Yes)
- 15 Do you feel that the classroom teacher's situation is essentially artificial, being far removed from the real day-to-day world ? (No)
- 16 Do you often wonder what on earth prompted you to become a school-teacher ? (No)
- 17 Does it seem to you that your colleagues fuss to an unnecessary degree over matters connected with school ? (No)
- 18 Do you find in your work that you often have to behave in ways which are basically unnatural to you ? (No)
- 19 Do you often feel that compulsory education for all children, is not necessarily a good idea ? (No)
- 20 Do you find teaching to be a job that is generally satisfying for you ? (Yes)
- 21 Do you feel that your teaching colleagues are for the most part rather dull and uninspiring people ? (No)
- 22 Do you feel that the majority of your pupils place little value upon school and school work ? (No)
- 23 Are you of the opinion that most teachers are just little cogs in big machines ? (No)
- 24 Are you for the most part in sympathy with the values and attitudes of your teaching colleagues ? (Yes)

Fig 6.2 continued

- 25 Do you find that the necessity of being in certain definite places at certain definite times in your work is rather irksome ? (No)
- 26 As the time for starting each of your lessons draws nearer, do you find yourself getting progressively more anxious or worried ? (No)
- 27 Do you feel that a substantial revision of the methods and organization in your school is long overdue ? (No)
- 28 Do you frequently have the feeling that you are wasting your talents and abilities in your present post ? (No)
- 29 Do you feel that you have a lot to offer your pupils which is of considerable educational value ? (Yes)
- 30 Are you of the impression that the staff of your school are mostly respected and valued by the pupils ? (Yes)
- 31 Do you believe that you would be able to teach more effectively in a school other than your present one ? (No)
- 32 Do you mostly feel that the children you teach accept and value the work you do with them ? (Yes)
- 33 Do you consider that you could show many of your colleagues a thing or two about effective teaching ? (Yes)
- 34 Do your lessons or teaching periods seem to pass quickly, so that you are often 'caught out' by the bell ? (Yes)
- 35 Do your pupils frequently express disappointment when the bell (or its equivalent) goes for the end of lessons ? (Yes)
- 36 If formal education were abolished tomorrow, so that school-teaching as a profession ceased to exist, would you be sorry about having to contemplate alternative work ? (Yes)
- 37 If it were announced that teachers' salaries were going to be reduced by 20%, would you actively seek alternative employment ? (No)
- 38 Do you feel that you are subject to an excessive number of petty and unnecessary restrictions during the course of your working day ? (No)
- 39 Have you several colleagues whose abilities and skills you admire ? (Yes)

Fig. 6.2 continued

- 40 Do you enjoy telling of your day to day teaching experiences to your friends and family ? (Yes)
- 41 Do incidents frequently occur in your work which you prefer to forget, and which you would not choose to tell other people of ? (No)
- 42 Do you worry over how your colleagues rate your performance as a teacher ?(No)
- 43 Does the large amount of time teachers spend talking shop, strike you as being somewhat tedious ? (No)
- 44 Do you find that having to 'discipline' children is somewhat distasteful ? (No)
- 45 Does the security of employment generally enjoyed by school-teachers mean a lot to you ? (Yes)
- 46 Do you feel that as a teacher you are doing at least as well financially as you would probably be doing in some other job ? (Yes)
- 47 Do you consider that the formal education of children is one of society's more important tasks ? (Yes)
- 48 If you were to win the football pools, would you immediately resign your job as a teacher ? (No)
- 49 Does your work give you a feeling of being part of a team ? (Yes)
- 50 Would you be content to be the sole teacher in a small village school with no immediate colleagues ? (No)
- 51 Are a lot of your friends schoolteachers ? (Yes)
- 52 When a stranger asks you what your job is, do you normally anticipate that he will be somewhat unimpressed by your reply ? (No)
- 53 Do you consider that by virtue of your occupation, you are a member of the upper middle class ? (Yes)
- 54 Do you feel that because of your profession you have a high status in the community ? (Yes)
- 55 Do a large number of people who know you consider that you don't do a real job of work ? (No)

Fig. 6.2 continued

- 56 Do you often wish that instead of being a schoolteacher you were any of the following; a lawyer, a doctor, a journalist ? (No)
- 57 Do you feel that your work helps you have a purpose in life ? (Yes)
- 58 Is it important to you that other people should know you are making the contribution you are to the educational system ? (Yes)
- 59 Do you feel that having the job you have, confers on you a definite place in society ? (Yes)
- 60 If you were to be declared redundant, and could not find any other work, would you at least welcome the opportunity to get a lot of things done which you are prevented from doing by your present comittment ? (No)
- 61 Do you find that your work helps you to get through the hours, days and weeks ? (Yes)
- 62 Do you think that if you were unemployed, you would most likely be very bored ? (Yes)
- 63 Would you welcome the introduction of longer holidays for teachers ? (No)
- 64 Do you find that the days and weeks seem to drag in term time ? (No)
- 65 Do you consider that teaching takes your mind off your worries and problems more effectively than other jobs might do ? (Yes)
- 66 Do you imagine that in most other jobs you would most likely be more isolated from other people than you are in teaching ? (Yes)
- 67 Does your job represent to you the realization of an ambition ? (Yes)
- 68 Does the fact that you have achieved qualified teacher status give you a sense of pride ? (Yes)
- 69 Are you of the opinion that your parents are pleased (or would have been pleased) that you do the work you do, rather than some other kind of work ? (Yes)
- 70 Do you consider that there is a greater feeling of 'team spirit' among teachers than among people in most other occupations ? (Yes)
- 71 Do you experience a feeling of common purpose with your colleagues, in that you are all working towards the same ends ? (Yes)

Fig. 6.2 continued

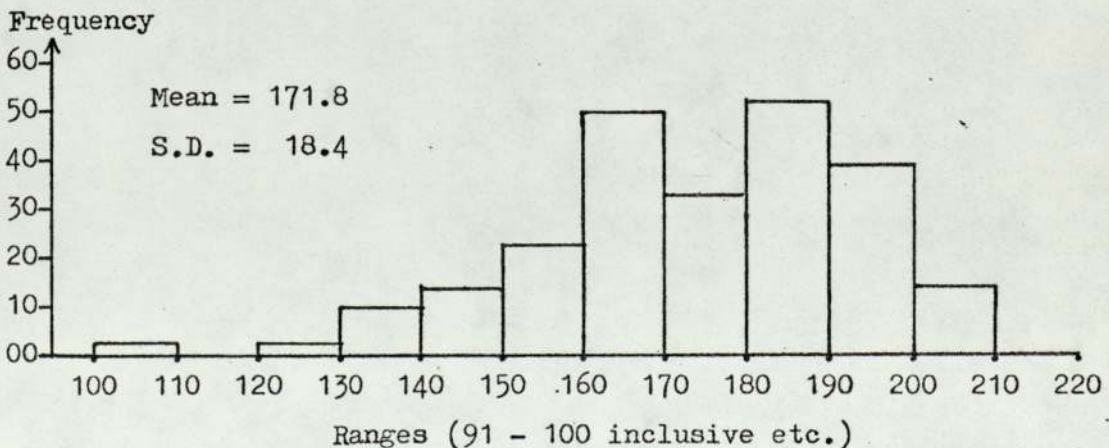
- 72 If you felt that many of your colleagues were not genuinely interested in the children's educational progress, would this bother you very much ? (Yes)
- 73 Would the prospect of spending the rest of your working life in classroom teaching, distress you greatly ? (No)
- 74 Are there very few jobs which you would rather have than your present one ? (Yes)
- 75 Do you frequently think of giving up school teaching for some alternative type of employment ? (No)
- 76 Would you prefer your daily routine to be much less well defined or prescribed than it is at present ? (No)

.....

6.2.2 Analysis of responses to the job-satisfaction questionnaire for serving teachers.

The responses made by each of the 231 respondents to each of the 76 items are coded in Table 9.4 in the appendices. A 'scoring' response for any item is indicated by the digit '3', while other responses score 2 ('Undecided') or 1. Summing the numerical equivalents of each response gives a raw score for each respondent on a scale whose minimum and maximum values are 76 and 228 respectively. The distribution of these raw scores is shown in Fig. 6.3 below.

Fig. 6.3 Distribution of raw scores on J/S scale for teachers



The distribution of these raw J/S scores is seen to be slightly skewed, but on the whole there does not seem to be any substantial departure from normality. The location of the distribution is however displaced towards the upper part of the range of scores available, suggesting the existence of some 50 or so 'free' points per respondent.

In order to assess the 'quality' of the various items of the questionnaire, the total data (i.e. that shown in Table 9.4) was subjected to an item analysis which determined the product-moment correlation between the scaling produced by each individual item and that produced by the rest of the items. The magnitudes of these correlations (known as 'item/rest-of-test' correlations) reveal the extent to which each item is consistent with the questionnaire as a whole, and the extent to which each item discriminates between respondents displaying different degrees of job-satisfaction. These correlations are listed in Table 6.01 overleaf. Inspection of the table permits identification of those items which contribute most and least effectively towards the measurement of job-satisfaction. With few exceptions, all the items correlate positively with the rest of the scale, and the few which correlate negatively, do so only to a very small degree.

The homogeneity of the J/S questionnaire is assessed by means of Cronbach's 'alpha' coefficient, defined as:

$$\alpha = \left(\frac{n}{n-1} \right) \left(1 - \frac{\sum S_i^2}{S_t^2} \right) \quad \text{where:}$$

S_i^2 = variance of any item
 S_t^2 = variance of whole test

In the present case the alpha coefficient has a magnitude of +0.863 with a 95% confidence interval in the range +0.84 to +0.89. The high value of the alpha coefficient obtained (its maximum value is 1.00) shows that even in its present form, the questionnaire comprises items which 'hang together' very well indeed.

Table 6.01 Item/rest-of-test correlations

Item	Correlation	Item	Correlation	Item	Correlation	Item	Correlation
01	+250	21	+433	41	+289	61	+251
02	+243	22	+332	42*	-089	62*	+168
03	+370	23	+390	43	+304	63	+310
04	+257	24	+393	44*	+143	64	+336
05*	+132	25	+288	45*	+014	65	+228
06*	+052	26*	+130	46*	+134	66*	+138
07	+411	27	+397	47*	+181	67	+455
08	+269	28	+483	48	+411	68	+342
09*	+143	29*	+150	49	+512	69*	+142
10	+246	30	+417	50*	+104	70	+288
11*	+200	31	+330	51*	+084	71	+471
12*	+045	32	+424	52*	+152	72	+293
13	+316	33*	-035	53*	+199	73	+341
14*	+119	34*	+179	54*	+222	74	+289
15	+415	35*	+137	55	+226	75	+482
16	+341	36	+412	56	+335	76	+320
17	+353	37	+363	57	+569		
18	+336	38	+351	58*	+103		
19	+348	39	+233	59	+249		
20	+468	40	+334	60*	+008		

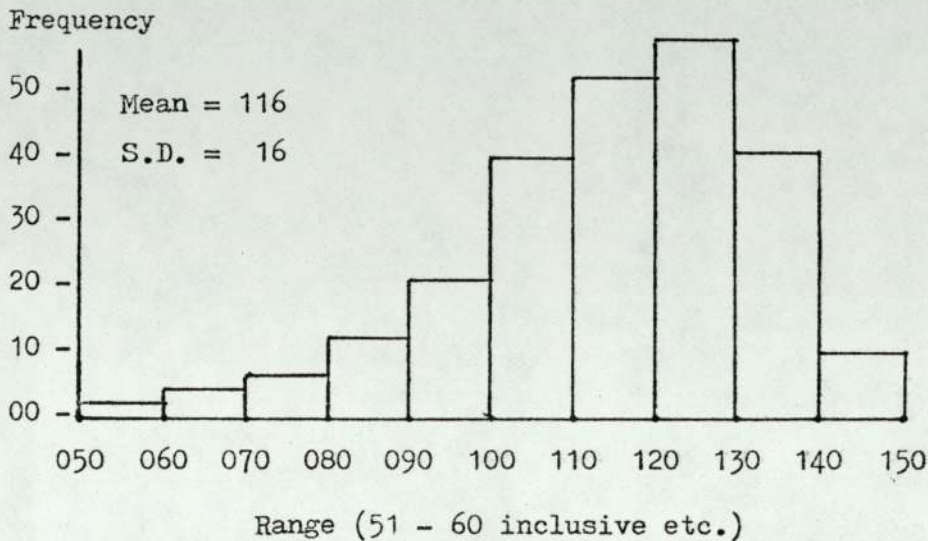
N.B. Decimal points have been omitted from the above table, and three decimal places are shown, so that the figure +045 for example, signifies a correlation coefficient of magnitude +0.045

* Signifies items which were not included in the final version of the job-satisfaction scale.

Both the homogeneity and the reliability of the scale can be increased by deleting those items which correlate either negatively, or positively to only a small extent with the rest of the scale. For the purpose of investigating the relationship between job-satisfaction and the various other factors, final J/S scores are based upon the best 50 items in the original set. These are the 50 items showing the highest correlations in Table 6.01 . Job-satisfaction scores for the 231 respondents, based upon these 'best' 50 items are

listed in Table 9.5 in the appendices, and the distribution of these scores is shown in Fig. 6.4 . The maximum and minimum possible scores on the 50-item scale are 150 and 50 respectively.

Fig. 6.4 Distribution of scores on a 50-item scale of job-satisfaction obtained from 231 serving teachers.



It is noticed that there exist respondent scores at all locations on this final scale, and that the distribution is more or less normal, though with a degree of skew which suggests that this final version of the scale discriminates more effectively between teachers experiencing lesser, rather than greater degrees of job-satisfaction. It is commonly assumed that most psychological variables are distributed normally and to conclude that measurement scales which do not reveal such a distribution in large samples (as in this case where $N = 231$) are in need of some modification. Such modification in the present case could have been accomplished by including more 'difficult-to-pass' items in the final scale. For example an item such as:-

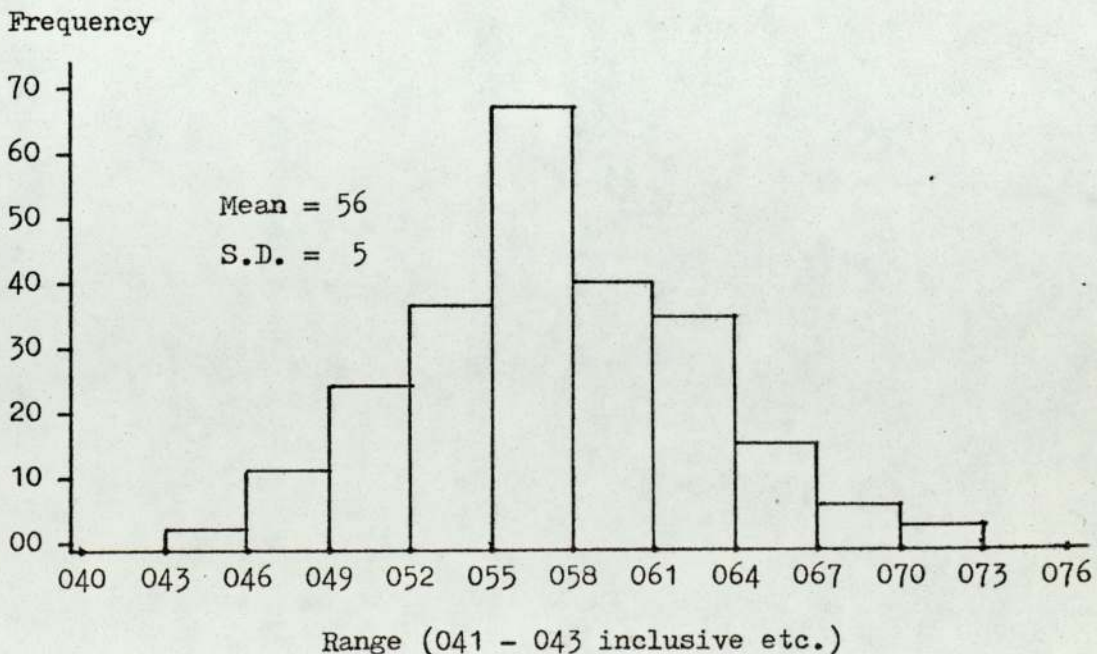
"Do you find your work to be continuously and totally exhilarating?"

would be unlikely to evoke a 'Yes' response from many teachers, and its inclusion would help to depress the modal score towards the middle

of the scale's range. Examples of specific items on the actual pilot scale which might for this reason have been left in the final scale, are items 53 and 60, which secured 'Yes' (high J/S) responses from only 10% and 18% of the respondents respectively. The important point about such items as these however, is that they lack discriminating power compared with those items which produce even proportions of responses in the various response categories. The principal function required of the 50 items selected for the final working version of the scale is their ability to discriminate at all levels between teachers experiencing different degrees of job-satisfaction.

Of interest is the distribution of the J/S scores of the 231 respondents on the 26 original items excluded from the final scale. The items concerned are those starred in Table 6.01 on page 87, which themselves form, in principle, a scale of job-satisfaction with scores ranging from 26 to 78. This distribution is shown in Fig. 6.5 below.

Fig. 6.5 Distribution of J/S scores of 231 respondents
derived from 26 rejected questionnaire items.



While this distribution is, as expected, somewhat narrow in its range, reflecting the relatively low discriminating power of the 26 items involved, it might well in other circumstances represent that of a reasonably satisfactory measurement scale. This is a consequence of the general suitability of the majority of the 76 items in the 'pilot' J/S scale.

Several correlations are of interest here. One is the correlation between the respondents' scores based on the 'best' 50 items forming the final J/S scale and the scores on the 76 items of the original scale. A second is the correlation between the scores based on the 'worst' 26 items (the rejected items) and those on the original 76 items. Next comes the correlation between scores based upon the 'accepted' 50 items and scores on the 'rejected' 26 items. Finally there is the correlation between J/S scores based upon the first and second halves of the 50 items of the final scale. This last correlation is of course an estimate of the 'split-half' reliability of the final J/S scale. These correlations are listed in Table 6.2 .

Table 6.2 Product-moment correlation coefficients derived from various sub-scales of the job-satisfaction scale for serving teachers.

Sub-scale scores correlated	Coefficient
Accepted 50 items with all 76 items	+ 0.962
Rejected 26 items with all 76 items	+ 0.603
Accepted 50 items with rejected 26 items	+ 0.394
First 25 accepted items with second 25 accepted items	+ 0.630

N = 231 cases. One-tailed critical value of the product-moment coefficient at the 1% level of significance with 229 degrees of freedom is 0.129

The relative magnitudes of the first three correlations in Table 6.2 evidence the fact that the majority of the discriminatory scaling of the questionnaire derives from the 50 items selected for the final scale. The second correlation in particular is of course inflated by the fact that the 26 items are partly being correlated with themselves. The last entry is an estimate of the reliability of the final scale, being one of the many possible 'split-half' reliability coefficients. As pointed out previously, a split-half coefficient is an underestimate of the reliability of a complete test, and the full-test reliability coefficient r_f is obtained from the split-half reliability coefficient $r_{\frac{1}{2}}$ by means of the Spearman/Brown formula:

$$r_f = \frac{2 * r_{\frac{1}{2}}}{1 + r_{\frac{1}{2}}}$$

In this case the estimated reliability coefficient for the full 50-item job-satisfaction scale is obtained from:

$$\text{Reliability Coefficient} = \frac{2 * 0.63}{1 + 0.63} = \underline{0.773} \quad (\text{significant at } 0.1 \%)$$

This last figure shows that the final J/S scale has an highly acceptable degree of reliability, comparable in magnitude with that of the best non-cognitive psychological factor measurement scales.

6.2.3 Shortened version of the job-satisfaction scale

The ten most 'diagnostic' items of the original seventy six can be identified by reference to the table of item/rest-of-test correlations shown in Table 6.01 on page 87. These are the ten items having the greatest power to discriminate between different degrees of job-satisfaction experienced by teachers, and would collectively form a useful short scale of measurement of teacher job-satisfaction. In ascending order of discriminating power, the items concerned are those numbered 30, 32, 21, 67, 20, 71, 75, 28, 49, and 57 in the original 76 item scale. These items are given overleaf in this order in Fig. 6.6

Fig. 6.6 Short form of a job-satisfaction scale for serving teachers

- 01 Are you of the impression that the staff of your school are mostly respected and valued by the pupils ?
- 02 Do you mostly feel that the children you teach accept and value the work you do with them ?
- 03 Do you feel that your teaching colleagues are for the most part rather dull and uninspiring people ?
- 04 Does your job represent to you the realization of an ambition ?
- 05 Do you find teaching to be a job that is generally satisfying for you ?
- 06 Do you experience a feeling of common purpose with your colleagues in that you are all working towards the same ends ?
- 07 Do you frequently consider giving up school-teaching for some alternative type of employment ?
- 08 Do you frequently have the feeling that you are wasting your talents and abilities in your present post ?
- 09 Does your work give you the feeling of being part of a team ?
- 10 Do you feel that your work helps you to have a purpose in life ?

(Sample Split-half Reliability of this scale is 0.71)

6.3 Phase B of research with serving teachers - the relationship between job-satisfaction and other factors (excluding personality characteristics of teachers)

6.3.1 Introduction to the Phase B investigation

As has been stated in Section 4 and in the present section, the links between teacher job-satisfaction and a number of other factors were conveniently explored by means of a set of supplementary questions/items included with the pilot job-satisfaction questionnaire. They were listed as items 77 to 84 and are reproduced in Fig. 6.7 overleaf. The response possibilities of each item are shown together with an indication (in brackets after each item) of the way in which each particular response was encoded.

Fig. 6.7 Supplementary questionnaire items

77 Are you a specialist teacher ? i.e. do you spend most of your time teaching just one or two subjects, or dealing with just one or two activities ?

Yes (1) Uncertain (2) No (3)

78 Please indicate your sex, by encircling the appropriate description.

Male (1) Female (2)

79 Please indicate your marital status by encircling appropriately.

Married (1) Single (2) Other (3)

80 Please show your length of service in full-time teaching by encircling. 1 to 3 years (1), 4 to 8 years (2), 9 or more (3)

81 Please encircle the age or ages of children you mostly teach in your present post.

Age in years of children taught 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17+

N.B. Judgement was exercised in the interpretation of the teachers' responses to this item in order to classify each teacher as working in either a First (1), Middle (2) or Secondary (3) school.

82 Please indicate whether you hold Certificate or Graduate qualifications. Graduate (2) Certificate (1) Other (3)

83 Please show the pay-scale which you are on at present.

Scale 1 (1), Scale 2 (2), Scale 3 (3), Scale 4 (4).
Scale 5 (5), Other (6).

84 Please attempt to estimate the extent to which you are involved in the decision-making processes in your school. I am interested in the extent to which you are consulted about questions of timetable, deployment, curriculum, rules etc. etc. and the magnitude of your influence in these matters. Please encircle appropriately, i.e. encircle one of the three descriptions:

Not at all involved; no influence on decisions. (1)

Moderate degree of involvement; moderate influence on decisions. (2)

Substantial degree of involvement; considerable influence on decisions. (3)

6.3.2 Analysis and discussion of the responses to items 77 - 83

The information gained from each of the 231 respondents by means of these supplementary questions is listed, in coded form, in Table 9.6 in the appendices. The basic approach to the analysis of each item is that of comparing the J/S scores of the teachers falling into each response category. The items will be dealt with in order.

Item 77 - degree of specialisation

The numbers of teachers falling into each response category together with the mean J/S scores of each category are shown below in Table 6.03

Table 6.03 Item 77 summary - mean J/S scores of specialist and non-specialist teachers

Response Category	No. of Respondents	Mean J/S score	S.D.
Specialist(1)	129	113.7	16.6
Uncertain(2)	3	124.3	5.7
Non-Specialist(3)	96	119.3	16.0

On the face of things it would appear that teachers specialising in just one or two subjects are deriving less job-satisfaction (on average about one third of a standard deviation) than non-specialising teachers. The (statistical) significance or otherwise of this apparent relationship is determined by subjecting the data summarised in Table 6.03 to a one-way analysis of variance. This gives the following result:

Source	Sum of squares	Degrees of freedom	Variance estimate	Variance Ratio F
Between groups	1917	2	959	3.63 ² ₂₂₅
Within groups	59499	225	264	
Total	61416	227	-	

The 5% significance value of the variance ratio F at 2/225

degrees of freedom is 3.04 . Since the observed value of F (3.63) exceeds this table value, then under a null hypothesis of no relation between specialisation and job-satisfaction, the probability of securing the distribution of means shown in Table 6.03 is less than 5% . Accordingly the null hypothesis is rejected in favour of the alternative hypothesis of a relationship between job-satisfaction and specialisation.

It is now necessary to assess the significance or otherwise of the observed differences between the mean J/S scores of the various groups. Only one difference is of interest here, this being the difference between the means of the specialist and non-specialist groups. The means concerned are 113.7 and 119.3 and it is the size of the difference between these (5.6) which is under scrutiny.

Since no a priori hypotheses concerning job-satisfaction and specialisation were proposed (see Section 4) a 'post hoc' comparison of means is appropriate. The Scheffe procedure, described in Burroughs (1976), gives a method of calculating the minimum magnitude 'S' of a difference between means at a chosen level of significance

from:

$$S = \sqrt{(k - 1) * F * \text{Error (within group) variance} * \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}$$

in which: k = the number of groups involved in the analysis (in this case 3)

F = the critical value of the variance ratio at the chosen level of significance and relevant degrees of freedom. (This is the F value obtained from the tables, against which an observed value is compared.) In this case the table value is 3.04

n_1 and n_2 are the numbers of respondents in the groups whose means are being compared - in this case 129 and 96 respectively.

Thus:

$$S = \sqrt{(3 - 1) * 3.04 * 264 * \left(\frac{1}{129} + \frac{1}{96} \right)} = \underline{5.40}$$

The observed difference (5.6) exceeds this calculated minimum value and it can be concluded that the difference between the mean J/S scores of specialising and non-specialising teachers is significant at the 5% level.

The relative importance of the 'specialisation' factor in the prediction of teacher job-satisfaction is evaluated by determining the proportion of the variance in J/S which is accounted for (or explained) by this factor. This proportion 'x' is given by:

$$x = \frac{\text{Between groups sum of squares} - (k-1) * \text{Within groups variance}}{\text{Total sum of squares} + \text{Within groups variance}}$$

In this case: $x = \frac{1917 - 2 * 264}{61416 + 264} = \underline{0.0225}$

The real significance of the specialisation/non-specialisation effect is indicated by this last figure - only 2 $\frac{1}{4}$ % of the variance in job-satisfaction in the sample is in fact accounted for by the specialisation factor.

It will be recalled that in Section 4 it was noted that the evidence on this matter was largely inconclusive. While it has been found here that non-specialising teachers are generally deriving greater work satisfaction than specialising teachers, two factors which confound the issue must be borne in mind. Firstly, the proportion of specialising teachers is much higher in secondary schools than in primary schools so that the J/S difference observed may simply be a reflection of differences in job-satisfaction between primary and secondary school teachers. Secondly, there are overall more male than female teachers in specialist roles, and the observed difference could well be a reflection of sex-differences in job-satisfaction.

On the whole it would probably be wrong to attribute too much psychological significance to the statistically significant difference which has been found.

Item 78 Sex

The numbers of teachers of each sex together with the mean J/S score in each case are shown below in Table 6.04

Table 6.04 Item 78 summary - mean J/S scores of males and females

Category	No. of respondents	Mean J/S score	S.D.
Male	102	110.6	16.7
Female	123	121.2	14.4

It would appear that female teachers secure greater job-satisfaction than male teachers by an average amount of approximately two thirds of a standard deviation. The one-way analysis of variance gives:

Source	Sum of squares	Degrees of freedom	Variance estimate	Variance ratio F
Between groups	6302	1	6302	26.2 ¹ / ₂₂₃
Within groups	55660	223	241	
Total	55962	224	-	

The 1% significance value of F at 1/223 df is 6.75 . Since the observed value of F exceeds this table value, then the probability of obtaining the observed difference in means under a null hypothesis of no relation between sex and job-satisfaction is less than 1% . Accordingly the null hypothesis is rejected in favour of the alternative hypothesis that male and female teachers experience different degrees of job-satisfaction. The observed difference between the mean J/S scores of men and women teachers is (121.2 - 110.6) i.e. 10.6 points on the J/S scale. The minimum difference for significance at the 1% level, S, is obtained as described previously from:

$$S = \sqrt{(2 - 1) * 6.75 * 241 * \left(\frac{1}{102} + \frac{1}{103} \right)} = \underline{5.63}$$

The observed difference between means is clearly significant at the 1% level.

The proportion of the variance in J/S which is accounted for by sex is given as described earlier by:

$$x = \frac{6302 - (2 - 1) * 241}{59962 + 241} = \underline{0.101}$$

This last result indicates that 10.1% of the J/S variance in the sample is accounted for by the sex factor. This result is consistent with the findings discussed in Section 4 though subject to the same difficulties in interpretation which were described in that section.

Item 79 - Marital status

The numbers of teachers in each response category together with the mean J/S scores are given in Table 6.05 below.

Table 6.05 Item 79 summary - Mean J/S scores according to marital status

Category	No. of respondents	Mean J/S score	S.D.
Married	156	116.1	16.5
Single	56	118.0	15.7
Other	11	113.6	16.6

The smallness of the difference between the means of the main groups is obvious and its lack of significance is confirmed by the magnitude of the variance ratio F from the analysis of variance applied to these data. At 2/220 df, the observed value of F is 0.449 while the 5% significance value is 3.04 . This result is consistent with the findings on this question which were discussed in Section 4.

Item 80 - Length of Service

Table 6.06 Item 80 summary - Mean J/S and length of service

Category	No. of respondents	Mean J/S score	S.D.
1-3 years	53	120.1	16.1
4-8 years	101	115.5	16.7
9+ years	75	114.2	16.2

This is an interesting result, in sharp contrast with the general trends referred to in Section 4. These trends were largely based upon North American surveys carried out some years ago. The present result may well reflect the current situation in the United Kingdom - the enthusiasm and pleasure associated with the early years of teaching giving way to disillusion and boredom in later years. However it is perhaps wrong to put so sharp a point on it, since the differences between the various groups concerned are not particularly large. The statistical significance of this 'length-of-service' effect is evaluated in the first place by means of a one-way analysis of variance which gives the following:

Source	Sum of squares	df	Variance estimate	Variance ratio F
Between groups	1177	2	588	2.19 ² ₂₂₆
Within groups	60688	226	269	
Total	61865	228		

The 5% significance value of F at 2/226 df is 3.04 . Since the observed value of F fails to equal or exceed the critical value, there is no basis for rejecting a null hypothesis of no association between length of service and teacher job-satisfaction. While an interesting trend has been observed, it would be unwise to read too much into these data.

Item 81 - Ages of Children taught

Table 6.07 Item 81 summary - Mean J/S scores of teachers working in various types of school.

Category	No. of respondents	Mean J/S score	S.D.
First school	35	120.7	15.0
Middle school	72	119.8	15.4
Secondary school	122	112.5	16.8

There would appear to be a sharp division between the degree of job-satisfaction experienced by Primary (First and Middle) school teachers and that experienced by secondary-school teachers. The difference between the mean J/S scores of these two groups is seen to be of the order of one half of a standard deviation. The statistical significance of this difference is assessed initially by a one-way analysis of variance which gives the following:

Source	Sum of squares	df	Variance estimate	Variance ratio F
Between groups	3372	2	1686	6.51 ₂₂₆ ²
Within groups	58493	226	259	
Total	61865	228	-	

Since the observed value of F exceeds the 1% table value at 2/226 df (4.70), the probability of obtaining the observed distribution of means under a null hypothesis H_0 is less than 0.01. Consequently H_0 is rejected in favour of the hypothesis that teachers in different schools (by age-range of pupils) experience different degrees of job-satisfaction.

The important differences between means whose post-hoc significance requires assessment are the differences between the First school and the Secondary school group and between the Middle and Secondary group. These differences are respectively 8.2 and 7.3.

The minimum differences S required for significance at the 5% level in each case are:

For the First school/Secondary school difference;

$$S = \sqrt{2 * 3.04 * 259 * \left(\frac{1}{35} + \frac{1}{122} \right)} = \underline{7.6}$$

For the Middle school/Secondary School difference;

$$S = \sqrt{2 * 3.04 * 259 * \left(\frac{1}{72} + \frac{1}{122} \right)} = \underline{5.9}$$

It is noticed that in both cases the observed differences between means exceeds the critical difference at the 5% level of significance. The proportion x of the variance in J/S which is explained by the ages-of-children-taught factor is given by:

$$x = \frac{3372 - (3 - 1) * 259}{61865 + 259} = \underline{0.046}$$

This last result puts the effect of ages-of-children-taught into perspective. Approximately 5% (4.6%) of the variance in teacher job-satisfaction is explained, in the sample concerned, by this factor.

The trend observed here is consistent with the conclusions reported in Section 4, but as has been pointed out, so many factors confound the issue of the influence of school-type upon teacher job-satisfaction; the 'sex' and 'specialisation' factors in particular tend to confuse matters for reasons which have been discussed.

Item 82 - Academic qualifications

Table 6.08 Item 82 summary - Mean J/S scores of teachers according to academic qualifications.

Category	No. of respondents	Mean J/S score	S.D.
Certificate	179	116.6	16.4
Graduate	46	115.2	17.6
Other	4	106.0	3.6

The difference between the means of certificated and graduate teachers is clearly of no significance and the smallness of the number of teachers with neither certificate nor graduate qualifications invalidates any conclusions about the rather low mean J/S score of this sub-group. The F ratio derived from a one-way analysis of variance applied to the Table 6.08 data is 0.90 . Given that the 5% significance value of F at the relevant degrees of freedom is 3.04, there is no basis for rejecting a null hypothesis of no association between teacher qualifications and job-satisfaction. This result confirms the findings reviewed in Section 4.

Item 83 - Salary scale

Table 6.09 Item 83 summary - Mean J/S scores of teachers on various pay scales.

Category	No. of respondents	Mean J/S score	S.D.
Scale 1	66	118.0	17.0
Scale 2	96	115.0	17.1
Scale 3	35	117.3	13.4
Scale 4	9	104.2	16.3
Scale 5	19	097.7	09.5
Other	19	122.2	13.4

It would appear that there is no systematic relationship between pay-scale and job-satisfaction though there are differences between the means of the various sub-groups and a one-way analysis of variance gives an F value of 2.59 which exceeds the 5% critical value (2.26 at 5/222 df). The pay-scale effect would appear to be significant at this level. The results of the analysis of variance are as follows:

Source	Sum of squares	Degrees of freedom	Variance estimate	Variance ratio F
Between groups	3398	5	680	2.59 ⁵
Within groups	58319	222	263	

The smallest minimum difference between group means S, obtained by Scheffe's procedure, will be that associated with the first two entries in Table 6.09, where the largest number of respondents exists. In this case:

$$S = \sqrt{(6 - 1) * 2.26 * 263 * \left(\frac{1}{66} + \frac{1}{96} \right)} = \underline{8.7}$$

The actual difference between the means of the two groups concerned is 3.0, which is therefore not significant at the 5% level. The largest observed difference exists between the last two entries in the table viz. 24.5 . The minimum difference S for significance at the 5% level in this case is given by:

$$S = \sqrt{5 * 2.26 * 263 * \left(\frac{1}{3} + \frac{1}{19} \right)} = \underline{33.9}$$

Again the observed difference fails to equal or exceed the critical difference at the chosen level of significance.

Thirteen other such post hoc comparisons are possible but it is clear by inspection of the data that none of these differences will be significant. In general it is concluded that there is no obvious link between pay differentials within the teaching profession and job-satisfaction.

The proportion, x, of the J/S variance which appears to be accounted for by the pay-scale effect is given by:

$$x = \frac{3398 - (6 - 1) * 263}{61717 + 263} = \underline{0.034} \text{ (i.e. a little over 3\%)}$$

Item 84 - Status in the decision-making hierarchy

Table 6.10 Item 84 summary - Mean J/S scores of teachers involved to different extents in decision-making.

Category	Number	Mean J/S	S.D.
No involvement;no influence.(1)	59	108.9	16.2
Moderate involvement and influence(2)	125	117.9	16.3
Substantial involvement;considerable influence.(3)	36	122.0	13.4

The trend would appear to be very clear in this instance, high job-satisfaction being positively correlated with greater expressed feelings of involvement and influence. The significance of this trend is first assessed by the one way analysis of variance which gives the following:

Source	Sum of squares	df	Variance estimate	Variance ratio F
Between groups	4717	2	2359	9.36 ² ₂₁₇
Within groups	54670	217	252	

The 1% table value of F at 2/217 df is 4.17 . Since the observed value exceeds this table value, the probability of obtaining the observed distribution of means under a null hypothesis is less than 0.01 . The null hypothesis is accordingly rejected at the 1% level of significance, in favour of the alternative hypothesis that the relevant factors are correlated.

The actual differences between the mean J/S scores of the teachers in the various categories are shown in Table 6.11 together with the minimum differences for significance at the 1% level (found using the Scheffe procedure)

Table 6.11 Post hoc comparison of the mean J/S scores of teachers expressing different degrees of involvement in decision making.

Comparison made	Observed difference between means	Minimum difference for 1% significance
Category 1 with Category 2	9.0	7.7
Category 1 with Category 3	13.1	10.3
Category 2 with Category 3	4.1	9.2

It is observed that the first two comparisons show differences which are very significant, and the conclusion is reached that higher teacher job-satisfaction is clearly associated with greater feelings of involvement in, and influence upon the decision-making activity in their schools.

The proportion of the J/S variance which is accounted for by this factor is given by:

$$x = \frac{4717 - (3 - 1) * 252}{59387 + 252} = \underline{0.071 \text{ or } 7.1\%}$$

The result obtained from the responses to Item 84 is in some ways the most interesting among the various results obtained from the supplementary questions on the J/S questionnaire. On this occasion, teacher-involvement in decision-making was being assessed by means of a relatively simple 3-point scale, and it was the teachers' subjective judgements which determined which category in Table 6.10 they entered. The categorisation imposed on the teachers by the other supplementary items (items 77 - 83) involved no such subjective considerations. Despite this, the degree of involvement in the running of a school which a teacher feels he has, would seem to be a potent determinant of the degree of job-satisfaction he experiences. It will be recalled that in Section 4 it was recorded that there was a dearth of conclusive evidence on this point. This involvement/influence factor is clearly worth investigating in greater detail. At the least it would be useful to develop a more comprehensive scale of measurement of the involvement/influence factor in order to test the hypothesis that this factor correlates positively with job-satisfaction.

It has to be remembered that a teacher's selection of the Category 1 response to Item 84 may well be a consequence of low job-satisfaction rather than a cause. For this reason an expanded scale of measurement of the involvement/influence factor would particularly need to contain a high proportion of 'matter of fact' as distinct from 'matter of judgement' items.

6.3.3 Summary of the results of Phase B of research with serving teachers.

The various results which have been presented and discussed in section 6.3.2 are summarised in Table 6.12 below.

Table 6.12 Summary of results obtained from questionnaire items 77-84 concerning factors relating to teacher job-satisfaction.

Factor	Result of analysis of variance	Result of post hoc comparison of means	Percentage of J/S variance explained by factor
Specialisation	Significant at 5% level	Difference significant at 5% level	2.25%
Sex of teacher	Significant at 1% level	Difference significant at 1% level	10.1%
Marital status	Not significant	-	-
Length of service	Not significant	-	-
Ages of children taught	Significant at 1% level	Primary/Secondary differences significant at 5% level	4.59%
Academic qualifications	Not significant	-	-
Pay scale	Significant at 5% level	No differences significant	3.36%
Involvement/influence	Significant at 1% level	Differences significant at 1% level	7.06%

On the face of it, it would seem that altogether some 25% of the variance in teacher job-satisfaction is accounted for by these various factors. There is however scope for further analysis (which will not be attempted here) in which the inter-actions between various factors could be explored, e.g. the interaction between sex and ages of children taught.

6.4 Phase C of research with serving teachers - the relationship between job-satisfaction and teacher-personality factors.

6.4.1 Personality scales employed

As stated earlier, the data collection involved in this phase of the research was accomplished by obtaining personality inventory data from a sub-set of 68 of the respondents who completed the job-satisfaction and supplementary factors questionnaire. The personality factor questionnaires involved were:

(a) Shortened versions of the Eysenck scales of measurement of the three broad personality dimensions Extraversion, Neuroticism and Tough-mindedness, found in Eysenck and Wilson (1975). These scales were used in preference to others such as the E.P.I. (Eysenck and Eysenck 1963) or the E.P.Q. (Eysenck and Eysenck 1975) for several reasons. Firstly, they permit 3-point Lickert style responses rather than simple Yes/No responses. Secondly, no 'lie-scale' items are involved - in the writer's opinion, lie-scale items are not only inappropriate but also somewhat insulting to respondents in this kind of research. Thirdly, the scales are longer and therefore in principle more reliable than those in single forms of the E.P.I. or E.P.Q. In fact, the original versions of the scales employed, contain 210 items for each broad factor, 30 of which in each case relate to each of the seven subordinate factors listed in Table 9.2. The scales were reduced in length by identifying 70 items from each dimension (10 per subordinate factor) which made good sense to practicing teachers. All personality questionnaires inevitably contain items which by their nature cannot be suitable for all respondents. For example, one of the Extraversion scale items:

" Do you frequently take a nap in the middle of the day ?"

is hardly a suitable question to ask teachers, since so few of them would have the opportunity of so doing even if they were so inclined.

The actual items to which the teachers were asked to respond are listed in the Appendices Fig. 9.1 . Each set of items forms a scale having a numerical range 0 to 140 points by scoring each response 0, 1 or 2 as required. The reliability of these scales is somewhat uncertain (the manuals of the E.P.I. and E.P.Q. suggest reliability coefficients of the order 0.75) but they can be determined empirically within the responding sample (see later).

(b) Form A of the Cattell (1970) 16 Personality Factor Questionnaire. Each factor is represented by some twelve or so items, and the reliability of the various factor scales, by short term test/re-test correlation, is claimed to be of the general order 0.75, which considering the relative shortness of the various scales is quite respectable.

The raw scores for each respondent on each of these nineteen personality factors (3 Eysenck and 16 Cattell), together with the respondents' Job-satisfaction scores (based upon the 'best' 50 items of the J/S scale) are shown in Table 9.7 in the Appendices. The means and standard deviations of the scores for each factor are listed in Table 6.13 below.

Table 6.13 Means and standard deviations of scores obtained from 68 serving teachers on scales of job-satisfaction and nineteen personality factors.

Factor	Mean	S.D.	Factor	Mean	S.D.
J/S	118	18.6	Cattell H	13.6	6.02
Eysenck E	66.7	15.3	Cattell I	12.4	4.07
Eysenck N	36.2	18.3	Cattell L	08.4	3.32
Eysenck T	62.5	16.9	Cattell M	14.5	3.47
Cattell A	10.0	3.07	Cattell N	09.9	3.14
Cattell B	09.8	1.47	Cattell O	10.4	4.16
Cattell C	14.5	4.01	Cattell Q ₁	08.4	3.81
Cattell E	12.2	4.54	Cattell Q ₂	12.4	3.23
Cattell F	12.1	4.62	Cattell Q ₃	12.4	3.46
Cattell G	12.6	3.45	Cattell Q ₄	13.9	5.41

Comparison of the entries in Table 6.13 with the general population scores (shown in Table 5.2, page 69) shows that for the most part there are no substantial differences between the research sample and the general population except, and not surprisingly, in the case of Cattell Factor B - Intelligence - where these teachers are on average scoring a good standard deviation above the general population.

The form of the distribution of raw scores for each factor is shown in the series of histograms in Fig. 6.8 overleaf. It can be seen that in nearly all cases there is no obvious departure from normality. The exceptions are the J/S and Eysenck N distributions, which appear to be slightly skewed, and the Eysenck E distribution which is markedly rectangular. Geary's test of normality can be applied (described in Burroughs - Op. cit.) in order to test the null hypothesis that the samples have been drawn from a parent population in which scores on the various factors are normally distributed.

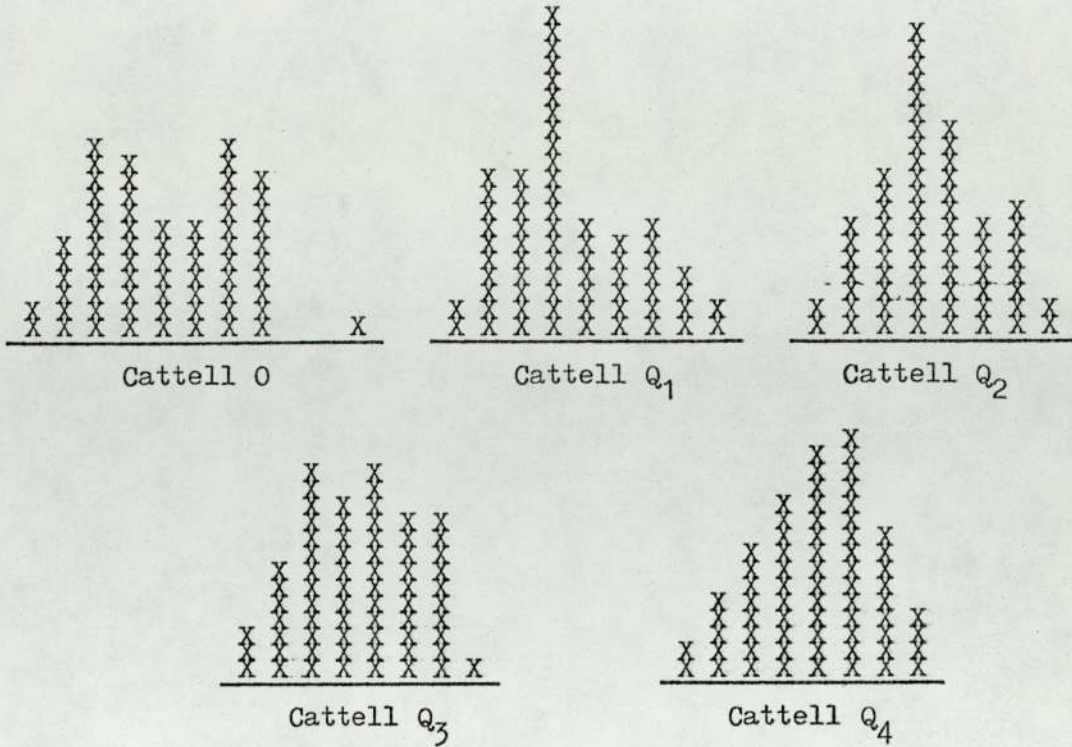
This test requires the calculation of a 'Sigma' score z

from:-

$$z = \frac{(a - 0.7979) \cdot N}{0.2123}$$

in which 'a' is the ratio of the mean deviation of the factor scores to their S.D.
N is the number of cases.

The application of this formula to the Job-satisfaction, Eysenck N and Eysenck E scores gives values of 0.54, 1.10 and 2.05 respectively for z. The departure from normality is significant at the 5% level if the observed value of z exceeds a magnitude of 1.96. It is seen that this just happens in the case of the Eysenck E scores and consequently some caution may need to be exercised in interpreting any apparent influence of this factor upon job-satisfaction revealed by parametric analyses.



6.4.2 Reliability of the Eysenck Scales

It is appropriate at this point to estimate the reliability of the three Eysenck Factor scales (E, N and T). This is accomplished by determining the product-moment correlation in each case between respondents' scores derived from the first and second halves of the scale items. These 'half-test' scores are listed in Table 9.8 in the Appendices, and the magnitudes of the various correlation coefficients are shown in Table 6.14 below together with the estimates of the 'full-test' reliability coefficients, obtained using the 'Spearman/Brown' formula. (The relevant procedures are explained in Section 5)

Table 6.14 Split-half and full-test reliability coefficients of Eysenck Factor scales.

Scale	Split-half reliability	Full-test reliability	N = 68 cases. One-tailed critical value of the product-moment correlation coefficient at the 5% level with 66 df. is 0.311
Eysenck E	+0.504	+0.670	
Eysenck N	+0.715	+0.834	
Eysenck T	+0.649	+0.787	

The reliability coefficients recorded in Table 6.14 are easily comparable with those of the various other measurement scales with which we are concerned here.

6.4.3 Predicting Job-satisfaction from personality factor data.

The main interest of the analysis of the Phase C data lies in the correlation between the Criterion variable (job-satisfaction) and the Predictor variables (the 19 personality factors). The forms of the relationships between the criterion and each of the predictors taken separately can be illustrated by means of the appropriate scatter diagrams. When these are plotted, examination reveals varying degrees of correlation between J/S and the other factors, with no suggestion anywhere of curvilinear regression. The extent of the linear regression existing in each case is shown by the product-moment correlation coefficients between job-satisfaction scores and scores on each personality factor scale. These coefficients are listed in Table 6.15

Table 6.15 Simple product-moment coefficients of correlation between Job-satisfaction and each of 19 personality factors.

Factor	Correlation	Factor	Correlation	Factor	Correlation
Eysenck E	+0.032	Cattell F	+0.263*	Cattell O	-0.133
Eysenck N	-0.162	Cattell G	+0.036	Cattell Q ₁	-0.336*
Eysenck T	-0.177	Cattell H	+0.208	Cattell Q ₂	-0.128
Cattell A	+0.451*	Cattell I	+0.351*	Cattell Q ₃	-0.060
Cattell B	+0.008	Cattell L	-0.163	Cattell Q ₄	+0.075
Cattell C	+0.107	Cattell M	-0.045	-	-
Cattell E	-0.090	Cattell N	+0.130	-	-

The 5% two-tailed critical value of the Pearson product-moment correlation coefficient obtained by interpolation from Morris (Op.cit.) has, with 66 df., a magnitude of 0.240 . This means that under null hypotheses of no association between the criterion variable

and any of the predictor variables, the probabilities of obtaining the coefficients observed in Table 6.15 are, with the exception of those which have been starred, greater than 0.05 . Accordingly there is no basis for rejecting the null hypothesis in the cases of the unstarred correlations. The probabilities under H_0 of obtaining the starred correlations are less than 0.05 in each case, and for these correlations the null hypothesis is rejected in favour of the alternative hypothesis of a correlation between job-satisfaction and location on these personality dimensions.

In many ways, the main findings of the research effort described herein is summarised in Table 6.15 . Four of the Cattell personality factors significantly relate to job-satisfaction among school-teachers. It is possible on the basis of the data to describe the personality characteristics of those who, other things being equal, are likely to experience a high level of job-satisfaction in school teaching. These characteristics are summarised in Table 6.16

Table 6.16 Personality characteristics associated with high levels of teacher job-satisfaction.

Factor	Description of factor	Correlation with J/S	Percentage of J/S variance explained by factor.
Cattell A (Affectothymia)	<u>Outgoing, warm-hearted, easy going, participating.</u>	+0.451	20.3%
Cattell F (Surgency)	<u>Happy-go-lucky, impulsively lively, gay, enthusiastic.</u>	+0.263	06.9%
Cattell I (Premsia)	<u>Tender minded, clinging, overprotected, sensitive.</u>	+0.351	12.3%
Cattell Q ₁ (Conservatism)	<u>Conservative, respecting established ideas, tolerant of traditional difficulties,</u>	+0.336	11.3%

On the face of things it would seem that more than one half of the variance in teacher job-satisfaction can be explained in terms of these personality factors, but it has to be borne in mind that

intercorrelations which may exist between these factors would mean that the real proportion is somewhat less. A better estimate of the actual proportion is obtained from multiple regression analyses. It was pointed out in Section 5 that a knowledge of the correlations between the various predictors (personality factors) and criterion (job-satisfaction) allows the construction of a set of simple regression equations, each of the general form:-

$$\hat{y} = a + b * x$$

Nineteen such equations could be obtained, in which predicted values of job-satisfaction (\hat{y}) could be obtained from a knowledge of the magnitude (x) of each personality factor score. The constants a and b would have values specific to each personality factor.

On the other hand, when information concerning the inter-correlations between the various predictor variables is available, as in the present case, it is possible to set up multiple regression equations of the general form:-

$$\hat{y} = a + b_{1*}x_1 + b_{2*}x_2 + b_{3*}x_3 \quad \text{etc.}$$

in which predicted values of job-satisfaction can be obtained from a knowledge of the scores x_1, x_2, x_3 etc. on several personality factors. As was also stated in Section 5, the correlation between predicted and observed values of the criterion is in this case a multiple correlation coefficient, whose magnitude may be significant even when none of the simple correlation coefficients are of significant magnitude. The first multiple regression analysis to be carried out on these data used the three Eysenck personality factors as the predictors, and as a first result the intercorrelations listed in Table 9.9 in the Appendices was obtained. From these the following multiple regression equation was derived:

$$\hat{J/S} = 136 + 0.082_*E - 0.187_*N - 0.268_*T$$

This equation is used to predict scores ($\hat{J/S}$) on the Job-

satisfaction scale from raw scores E, N and T on the Eysenck scales. The correlation between observed J/S scores and the values predicted by the equation i.e. the multiple correlation coefficient R has a magnitude of:

$$R = +0.274$$

It will be observed that this multiple correlation is considerably greater than any of the simple correlations listed in Table 6.15 . However, the two-tailed 5% critical value of the multiple correlation coefficient with 4 variables and 64 degrees of freedom, is found by interpolation from the table in Guilford (1965) to be 0.388 . Since the observed correlation coefficient fails to equal or exceed this critical value, there is no basis for rejecting a null hypothesis of no association between teacher job-satisfaction and the Eysenck personality factors taken collectively.

The second multiple regression analysis utilised all sixteen of the Cattell factors as predictors and is based upon the inter-correlations listed in Table 9.10 in the Appendices. It is seen that more than 25% of these correlations are significant at the 5% level although most of these are fairly small in magnitude. The larger correlations are those one would expect to find on examination of the nature of the factors concerned. The highest common variance (43%) exists between factors O and Q₄ ('Untroubled Adequacy' and 'Low Ergic Tension'). From these intercorrelations the following multiple regression equation is obtained:

$$\hat{J/S} = 103 + \left\{ \begin{array}{llll} + 1.961_{*A} & - 0.594_{*B} & + 0.270_{*C} & - 0.276_{*E} \\ + 0.892_{*F} & + 0.356_{*G} & + 0.040_{*H} & + 1.173_{*I} \\ - 0.265_{*L} & - 0.565_{*M} & - 0.021_{*N} & - 0.570_{*O} \\ - 1.281_{*Q_1} & + 0.213_{*Q_2} & - 0.717_{*Q_3} & + 0.279_{*Q_4} \end{array} \right\}$$

This is the equation which can be used to obtain a prediction of the teacher job-satisfaction scale score of a person whose raw scores (A, B etc Q₄) are known on each of the Cattell factor scales. The correlation between observed and predicted J/S scores i.e. the coefficient of multiple correlation R is of magnitude 0.6616 .

The two-tailed, 5% critical value of R with 17 variables and 51 df. is found by interpolation of the Guilford (Op.cit.) table to be 0.602 . Since the observed value of R exceeds this critical value, then the probability of obtaining this observed value under a null hypothesis H_0 of no association between J/S and the Cattell factors is less than 0.05 . Accordingly, H_0 is rejected in favour of the two-tailed alternative hypothesis of an association between personality organization as defined by the Cattell system, and teacher job-satisfaction. The principal hypothesis of this research is thus confirmed.

The proportion of the variance of J/S within the research sample, which is predicted (or explained) by all 16 Cattell factors is given by R^2 i.e. by 0.6616^2 which equals 0.4377 . In other words, 43.77% of the within-sample variance in J/S is explained by the 16 Cattell factors.

The standard error in predicted job-satisfaction scores within the sample is obtained from:-

$$\text{Standard error of J/S} = \text{Observed standard deviation of J/S scores} * \sqrt{1 - R^2}$$

In this case therefore:-

$$\text{Standard error of J/S} = 18.6 * \sqrt{1 - 0.6616^2} = \underline{13.9}$$

The meaning of this last statistic is that the 95% confidence interval for predicted J/S scores is $4 * 13.9$ i.e. 55.6 points on the J/S scale. In other words there would be a 95% probability that a true J/S score would lie within $2 * 13.9$ i.e. 27.8 points on either side of the value predicted by the equation.

It has been pointed out by Guilford (1965) that a sample multiple correlation coefficient tends to be a somewhat inflated estimate of the population value. A common way of 'shrinking' a sample coefficient R to a more probable population value c_r is by means of the

formula:-

$${}_cR^2 = 1 - (1 - R^2) * \frac{N - 1}{N - m}$$

where N and m are the numbers of cases and variables respectively, in the sample.

In the present case:-

$${}_cR^2 = 1 - (1 - 0.6616^2) * \frac{68 - 1}{68 - 17} = \underline{0.2612}$$

so that the 'corrected' multiple correlation is of magnitude 0.511 , the proportion of population variance in J/S accounted for by the 16 Cattell factors is 26.12%, and the standard error in values of J/S predicted by the equation becomes 15.98 points on the J/S scale.

It is noticed that the regression weights 'b' in the multiple regression equation (which includes all 16 Cattell factors) on page 115 are greatest in the expected cases i.e. for the four factors A, F, I and Q₁ where they mostly exceed a value of unity. The regression weights of the other twelve factors are by and large so small as to make the inclusion of these factors in the prediction equation more or less superfluous. The multiple regression analysis employing only the four 'significant' Cattell factors as predictors, gives the following prediction equation:-

$$\hat{J/S} = 87.7 + 2.01_*A + 0.91_*F + 1.08_*I - 1.67_*Q_1$$

This gives a coefficient of multiple correlation of magnitude $R = \underline{0.6373}$. The 2-tailed, 1% critical value of R with 5 variables and 63 df., is found from Guilford (Op. cit.) to be of magnitude 0.433 . Since the observed value exceeds this critical value, the probability of occurrence of the observed value under a null hypothesis of no association between job-satisfaction and the four Cattell personality factors involved, is less than 0.01 . Accordingly the null hypothesis is rejected in favour of the alternative hypothesis of an association between J/S and personality as defined by these four factors.

The proportion of J/S variance within the research sample which is explained by these four factors is given by R^2 i.e. by 0.4061

or 40.61% . The standard error in predicted J/S scores within the sample, found by the method described earlier, is of magnitude 14.33 . The significance of this last statistic has also been discussed earlier.

At first sight it might appear that a slight loss results from the exclusion of 12 of the Cattell factors from the prediction equation, since when only the four predictors are involved, the 'within-sample' multiple correlation coefficient is less, and the 'within-sample' standard error in predicted J/S is greater. However, we are more concerned with population parameters rather than with sample statistics, and as has already been shown, the within-sample multiple correlation coefficient over-estimates the population value, while the within-sample standard error in predicted J/S is an under-estimate of the population value. In the 4-predictor case, the corrected value of the multiple correlation coefficient, i.e. the estimate of the population value is:-

$$R = \underline{0.6068} \text{ (36.8\% common variance)}$$

This can be compared with the 16-predictor population value of $R = \underline{0.511}$. Similarly, the population standard error in predicted J/S becomes 14.78, compared with the 16-predictor population standard error of 15.98 .

One measure of the utility of a prediction equation is the size of the standard error of predicted criterion scores. A useful alternative measure is the 'index of forecasting efficiency' defined by Guilford (Op.cit.) and others as 'the percentage reduction in errors of prediction by virtue of correlation between predictors and criterion'.

This percentage is obtained from the general simplified formula:-

$$E = 100 * (1 - \sqrt{1 - R^2}) \quad \text{where E is the forecasting efficiency and R is the (population) correlation between predictors and criterion.}$$

Substitution of the relevant figures in the above equation gives forecasting efficiencies of 14.05% and 22.94% in the 16- and 4-predictor situations respectively. Although these efficiencies might appear to be somewhat small, it is important to consider them in a relative rather than in an absolute sense. For example, the efficiency of predictions

based upon the typical rather unsystematic interview is probably less than 5%. With this figure as a baseline, these forecasting efficiencies look much better.

6.4.4 Summary of results of multiple regression analyses

The main results of the preceding multiple regression analyses are summarised for convenience and comparison in Table 6.19 below. While no significant association between job-satisfaction and the three Eysenck factors was found, the relevant summary statistics have been included for the sake of completeness.

Table 6.19 The prediction of teacher job-satisfaction from personality data; summary of multiple regression analyses.

Summary statistic	Predictors		
	Eysenck Factors E,N,T.	All 16 Cattell Factors	Cattell Factors A,F,I,Q ₁
'Within-sample' correlation between predicted and observed values of criterion.	0.274	0.662	0.637
Percentage of within-sample criterion variance explained by predictors.	7.5%	43.7%	40.6%
Within-sample standard error of predicted criterion scores.	17.89	13.9	14.33
Estimated 'population' value of correlation between predictors and criterion.	0.178	0.511	0.607
Estimated percentage of population variance explained by predictors.	03.1%	26.1%	36.8%
Estimated population standard error in predicted criterion scores.	18.30	15.98	14.78
Forecasting efficiency of prediction of criterion in population.	01.6%	14.1%	22.9%

N.B. The standard errors in predicted criterion values relate to a criterion scale with sample (N = 68) mean and S.D. of 118 and 18.6 respectively. The standard error of the population criterion mean is $18.6 \div 67$ i.e. 2.27

6.4.5 Discussion of the results of Phase C of the research with serving teachers.

It is appropriate to consider the findings summarised in 6.4.4 with reference to hypotheses and previous results. It will be recalled that the poll of 'teacher-educators' (reported in Section 3) produced no fewer than 78 predictions concerning teacher job-satisfaction and personality factors. In particular, 12 of the 19 factors were predicted as being relevant. Of the four factors which have in fact been shown to be relevant, Cattell factor F was 'missed' by those polled. It has to be admitted though, that this factor showed the smallest (significant) correlation with job-satisfaction. The poll group got the direction of the correlation right in the case of Cattell factor A but wrong in the case of Cattell factor I. They mostly felt that 'tough-minded' people would more enjoy their teaching work than 'tender-minded' people, whereas the reverse has been shown to be the case. The teacher-educators were equivocal about the direction of correlation in the case of Cattell factor Q₁.

The relevance of Cattell factor F was observed by Lamke (Op. cit.) and discussed in Section 3. In this case it will be recalled that Lamke observed a correlation between this factor and teacher competence. Lamke also found Cattell factor H to be relevant in this context, and it is worth noting that the correlation between J/S and this factor observed in the present research was of a magnitude which was almost significant at the 5% level.

Of the Cattell factors which Ward and Rushton (Op.cit.) found to be loaded on job-satisfaction (A, E, N and O), only factor A has been shown to be relevant here, but the direction of the correlation found in the present research, is opposite to that found by Ward and Rushton. It will be recalled that the adequacy of the job-satisfaction scale employed by Ward and Rushton was questioned in Section 3.

It will also be recalled that no correlation between 'anticipated' job-satisfaction and personality was observed in the case of teachers in training (see Section 4). It is interesting to speculate as to the reason for this in the light of the fact that such clear job-satisfaction/personality relationships have been established for serving teachers. The most likely explanation derives from the fact that both personality factors and factors in the teacher's working environment correlate with his work attitude. It is a fact of life that people in permanent employment can generally make gradual alterations to some features of their working environments to suit themselves. A full-time teacher can usually make a number of alterations in routines, curriculum, position of desks etc. but a trainee teacher is denied such privileges and has to like or lump what he finds during his teaching-practice periods. It could well be that trainee teachers' anticipated job-satisfaction is so dominated by factors in the training environment that any correlations between A.J.S. and personality are masked.

7.0 General Summary

In Section 1 (pp. 10-13), the general problem under scrutiny was stated. This concerned the value of personality factor data in the prediction of job-satisfaction among school teachers, together with the determination of the degree to which job-satisfaction variance is accounted for by variables other than personality factors. The purpose of the research concerned the bases of selection of students for teacher training. Selection methods are often, in the author's experience, somewhat arbitrary, and in the current climate of reduction of numbers of students being accepted for teacher training, it is all the more important to be in a position to counsel applicants as comprehensively as possible. Part of this counselling process ought clearly to attend itself to the question of whether a given applicant for training is likely to enjoy, to a reasonable extent, working with children in schools. It was proposed that the nature of the personality characteristics of any teacher-training applicant might well reveal his likely level of job-satisfaction in school teaching. A key issue was seen to be the question of stability over time of personality characteristics (see p.12), since the research strategy required comparison of job-satisfaction data with the current personality characteristics of serving teachers.

The nature of job-satisfaction was considered at length in Section 2, where theoretical models (motivation theory - Maslow, Herzberg's theory, Equity theory) and empirically determined models, were each discussed and evaluated. The conclusion was reached that it would be inappropriate to base any job-satisfaction assessment procedure upon any one specific model. Procedures for the assessment

of job-satisfaction were also discussed in Section 2, and analyses of their nature revealed fairly clearly, that the present research would derive greater validity from the use of scales of job-satisfaction measurement which specifically focussed upon school teachers and their work.

Scientific (i.e. factor-analytically based) approaches to the description and assessment of human personality were discussed in Section 3.1 where it was indicated that the Cattell and Eysenck systems/scales would be used in the collection of personality data for the purposes of the present research. The ability of people to make consistent predictions of teacher job-satisfaction on the basis of teacher personality characteristics was investigated, and the results of the poll of teacher-educators, described in Section 3.2, revealed that of nineteen personality factors under scrutiny, no fewer than twelve were considered to be relevant. Research into the actual relationships between teacher personality and teacher job-satisfaction was reviewed in Section 3.3 (pp.41-50). The majority of this research dealt with job-satisfaction/personality-structure relationships somewhat indirectly. It was concluded (p.50), that progress in this area requires careful attention to problems of definition, instrumentation and criterion.

Results of research into the dependence of teacher job-satisfaction upon factors other than personality characteristics, eg. aspects of a teacher's working environment, were reviewed in Section 4. (pp.51-55). It was shown that results in this area, are either generally inconclusive, or rather difficult to interpret, because of the influence of confounding variables (see page 52 for example, where sex differences in job-satisfaction are discussed).

Section 5 consists of the account of the present author's research into the relationship between the personality structures of a

group of postgraduate trainee teachers and their estimates of the degree of job-satisfaction they had experienced during their training periods out working in schools. The bases of the construction of a scale of 'anticipated job-satisfaction' for trainee teachers is described in Section 5.2 (pp.56-57), together with an account of its development and refinement. It was shown that the final working version of the scale had a within-sample, split-half, reliability coefficient of magnitude +0.850 . The determination of the relationship between measures of 'anticipated job-satisfaction', based on this scale, and measures of the trainee teachers' personality characteristics, is described in Section 5.3 (pp.67-75) and the results of the analyses of the data obtained, by simple and multiple correlation methods, are summarised in section 7.2 below.

A detailed account of the main research associated with this thesis is given in Section 6. The preparation and development of a scale of job-satisfaction for serving teachers is described in Section 6.2, in which the characteristics of the scale are analysed. In its raw form, it displayed an homogeneity (alpha) coefficient of magnitude 0.865 ± 0.025 , based upon responses from 231 serving teachers. The final (reduced) version of the scale, upon which subsequent analyses were based, was observed to give a very slightly skewed distribution of final job-satisfaction scores in the sample, and to have a reliability coefficient of magnitude 0.77 . The ten most 'diagnostic' job-satisfaction questionnaire items of the original pool of 76 items, are presented in Figure 6.6 as a useful short scale of measurement of teacher job-satisfaction.

A comprehensive analysis of the dependence of teacher job-satisfaction upon variables other than teacher-personality factors is presented and discussed in Section 6.3 . The main results are summarised in Table 6.12 (page 106), where it is observed that some 25%

of job-satisfaction variance may be determined by these variables. The main conclusions derived from this part of the research are summarised in Section 7.3 below.

The investigation of the dependence of teacher job-satisfaction upon teacher-personality factors is described in Section 6.4 . The personality scales employed, and their characteristics in relation to the sample under scrutiny, are discussed in Sections 6.4.1 and 6.4.2 . In the following sections (6.4.3 to 6.4.5) the form and nature of the observed relationships between job-satisfaction and personality is analysed, discussed and summarised. The main results of this present research are expressed quantitatively in Table 6.19 (page 119), in which it is observed that some 37% of job-satisfaction variance is accounted for by Cattell factors A,F,I and Q₁ taken collectively, and that when used as predictors, these four factors have a population forecasting efficiency of some 23%. The main conclusions from this part of the research are also summarised in Section 7.3 below.

7.1 Conclusions from previous research into teacher job-satisfaction.

This has not generally revealed any job-satisfaction/ personality relationships which are both significant and substantial. In most cases, eg. La Bue (1955), Gage (1963), Lamke (1951), Erikson (1954), Hadley (1954) and Ryans (1960), personality factors have been linked only indirectly with job-satisfaction. Where the link has been direct, eg, Ward and Rushton (1969), the assessment of work attitude has been of a rather limited nature.

Relations found between job-satisfaction and factors other than personality characteristics have on the whole been insubstantial and difficult to interpret - see Section 4 and Barrett (1975).

7.2 Conclusions concerning the present research.

As a result of the research reported here it would seem possible to indicate, with a fair degree of confidence,

- (a) what kind of people (in terms of personality structure) will derive high levels of satisfaction from working as school teachers, and
- (b) what features of teachers' working environments are conducive to higher levels of job-satisfaction.

The people

They will tend to be goodnatured, easy-going, emotionally expressive, ready to cooperate, attentive to people, soft-hearted, kindly, adaptable. They like occupations dealing with people and socially impressive situations. They readily form active groups. They are generous in personal relations, less afraid of criticism, better able to remember names of people. (Affectothymia).

They tend to be cheerful, active, talkative, frank, expressive, effervescent, carefree. They are frequently chosen as elected leaders. They may be impulsive and mercurial. (Surgency)

They tend to be tender-minded, day-dreaming, artistic, fastidious, feminine. They are somewhat demanding of attention and help, impatient, dependent, impractical. They dislike crude people and rough occupations. They tend to slow up group performance, and to upset group morale by unrealistic fussiness. (Premsia)

They are confident in what they have been taught to believe and accept the 'tried and true', despite inconsistencies, when something else might be better. They are cautious and uncompromising in regard to new ideas. Thus they tend to oppose and postpone change, are inclined to go along with tradition, are more conservative in religion and politics, and tend to be interested in analytical 'intellectual' thought. (Conservatism)

N.B. The above descriptions have been taken from Cattell and Eber (Op. cit.)

The circumstances

They are likely to be teaching as generalist rather than as specialist teachers, and to be dealing with several areas of the school curriculum. They will be female rather than male (it is difficult to classify this factor as a 'circumstance'). They will be working in an Infant or Junior school rather than in a secondary school. They will have at least a moderate degree of involvement in, and influence upon, matters relating to school organization, such as time-table, staff deployment, curriculum, rules etc.

Trainee Teachers

The study carried out upon teachers in training, described in Section 5, revealed no significant association between their personality characteristics and their evaluation of their work experience. Possible reasons for this have been proposed in Section 6.4.5

7.3 Evaluation of the findings

It is appropriate to attempt to evaluate as realistically as possible the validity, consistency and utility of the present findings.

Validity. Two aspects of the validity of the results can be distinguished. The first is concerned with their internal validity, i.e. with the validity of the relationships found within the various samples. This depends upon the validity of the various measurement scales which have been employed. For the most part, scale validities have been well argued by their various authors, and the face validities of the scales devised specifically for this research are self evident (though further reference will be made to this matter in section 7.5). It is however the second aspect of the validity of the present findings which needs special attention. This is the question of their external validity, i.e. of the degree to which the within-sample findings can be generalised to the parent populations. The confidence with which it is possible to claim that the present results will be generally true is determined very largely by the confidence which can be placed in the 'quality' of the various samples.

The first quality factor is the degree to which the samples are representative of the population. The standard operational way of securing this characteristic is through the process of random selection. 'Random' effectively means 'without bias', so that every individual in the parent population must have the same chance of selection as any other. It can be seen in the present context that this principle by no means operates with respect to the entire British population of school teachers. Only those teachers defined by the sampling procedure described on pages 77-78 had the opportunity of entering the sample, and the results can only, strictly speaking, be generalised to this particular teacher population. While this limitation upon external validity is

freely acknowledged, it is nevertheless difficult to imagine that this sub-population should be to any significant extent atypical. The sampling procedure used with this particular sub-population followed the requirements of random selection in principle, though as pointed out in Section 6.1 there did exist in practice the possibility of some loss of sampling control. It is well known that a degree of systematic bias can creep into any sample where the response rate is less than 100% (as is probably the case in a great deal of social science research of the kind presented here) and it is admittedly exceedingly difficult to estimate the actual extent of this possibility. There could in fact have been more response refusals than were actually admitted (see page 78) and the effect of this would again be difficult to gauge.

It is important not to claim more than is reasonable about any sample, and the 'courier' method of sampling which was used in the research with serving teachers inevitably leads to a degree of uncertainty about the possibility of bias. Each courier agreed to select three of his teaching colleagues 'at random', and to ask them to complete the various questionnaires. It would have been all too easy for a courier to ask only close friends, in order to avoid having to approach any colleagues from whom rather negative reactions might be anticipated. Alternatively, in the face of refusals, couriers may well have drawn again and again from their colleague 'pools' until they had secured the requisite number of respondents. In both cases, bias of a rather uncertain nature could contaminate the samples, and would impose some limitations upon the confidence which can be placed upon the various conclusions.

The second 'sample quality' factor which merits consideration is its size. The principle findings of the present research are based upon a sample size of $N = 68$ and it is interesting to consider whether or not this number is sufficiently large. How large should a sample be? There is no simple answer to this question although it is clear at the outset that it must be large enough to allow the effect of randomness to operate. No gambler would stake his shirt on the expectation that an unbiased coin tossed ten times would give precisely five 'heads', but he would be more confident that a coin tossed 1,000 times would yield between (say) four and six hundred heads, knowing that the randomness effect would most likely have had its opportunity of expressing the theoretically probable outcome. While there are no hard and fast rules about the minimum size of a sample which permits adequate expression of the effect of randomness, it is possible to determine minimum sample sizes for other purposes. Population parameters are estimated from sample statistics and it is possible to work within defined error limits in the estimation of these parameters by using a sample of sufficient size. This process can be illustrated in the present case by considering the problem of estimating the mean J/S scale score of the parent population of serving teachers from which the sample was drawn, given the sample mean and standard deviation. The 95% confidence limits of such an estimate are given by:-

$$1.96 * \text{Standard Error (S.E.) of the sample mean}$$

If we were to decide that we needed to be able to express the population mean J/S score in the following way (i.e. within the specified limits of error):-

$$\text{Population mean J/S score} = \text{Sample mean J/S score} \pm 5 \\ \text{(with 95\% confidence)}$$

then we should have:-

$$5 = 1.96 * \text{S.E. of sample mean}$$

The standard error of the sample mean is given by:-

$$\text{S.E.} = \frac{\text{sample standard deviation}}{\sqrt{n}}$$

Combining these ideas and using the sample S.D. figure of 18.6 we have:-

$$5 = 1.96 * \frac{18.6}{\sqrt{n}} \quad \text{where } n \text{ is the minimum sample size for the magnitude of the 95\% confidence limits selected}$$

$$\text{Thus:- } n = \left(\frac{1.96 * 18.6}{5} \right)^2 = \underline{53}$$

It is clear therefore, in this example, that a sample size of $N = 68$ is more than adequate for the error limits specified. Analogous examples could be formulated with respect to error limits of correlations though it has to be remembered that all the estimated population values given on p.119 are obtained by methods which take the sample size into account, and are expressed in terms of known error limits. Finally, on this point, it is worth noting that very large samples are sometimes used in order that rather small correlations have the opportunity of exceeding the statistically significant critical values (which become smaller as samples get larger). In the author's opinion there is often little of psychological significance to be derived from this strategy.

Consistency of the present findings

There is a slight hint of inconsistency between the Cattell personality factors which have been found to predict teacher job-satisfaction. This arises from the problem of choice of language to communicate the meaning, in everyday terms, of factor-analytically derived personality dimensions. It will be observed that both 'adaptability' (seen in the description of Cattell Factor A on page 122) and 'conservatism' (Cattell Factor Q_1) correlate with high J/S. At first sight, these two might be perceived as contrary traits but the inconsistency is more apparent than real. The social 'adaptability'

associated with affectothymia is quite different in its nature from the kind of ideational flexibility or adaptability associated with 'radicalism' (and therefore not associated with 'conservatism'). Moreover, there is ample evidence that the two factors (A and Q_1) are quite independent of each other i.e. uncorrelated. In the present sample for instance, the intercorrelation between them (see table 9.10) was observed to be 0.037 - virtually zero.

While four of the Cattell factors have been found to relate to teacher job-satisfaction, none of the Eysenck factors did so, and it is interesting to consider the consistency or otherwise of this fact. Four, broader, second-order factors can be derived from Cattell's 16 primary factors, by methods described in Cattell and Ebel (Op.cit.). These are Low versus High Anxiety, Introversion versus Extraversion, Tender-minded Emotionality versus Alert Poise, and Subduedness versus Independence. The first two of these are clearly similar in their nature to two of the Eysenck factors which were investigated. Slightly surprising is the fact that two of the Cattell factors which were found to be related to teacher job-satisfaction (A and F) are factors which contribute to Cattell's second-order Extraversion factor. Despite this, the Eysenck Extraversion factor was unconnected with job-satisfaction. Without actually doing the arithmetic, it would seem almost certain that while the Cattell second-order Extraversion factor does correlate positively with teacher job-satisfaction, the Eysenck Extraversion factor, as measured, fails to do so.

No such inconsistency exists however between the cases of the Cattell second-order 'Anxiety' factor, and the closely related Eysenck 'Neuroticism' factor. None of the Cattell primaries which contribute to his Anxiety factor (L, O, Q_4, C, H, Q_3) were found to be related to job-satisfaction, and again, overall Anxiety measures would be unlikely to show any association with job-satisfaction.

The third of Cattell's broader factors bears only a small resemblance to the Eysenck Tough-mindedness factor, and any discussion of the relationship between them is unnecessary here. The Cattell Tenderminded Emotionality versus Alert Poise dimension is in fact derived from the Cattell primaries A, C, E, F, I, N and M, two of which, it is noticed, also figure in the derivation of his second-order Extraversion factor.

Utility of the findings

The general question of the usefulness of prediction test-batteries in vocational guidance or selection will be discussed in section 7.4. What must be assessed here is the specific use to which the results obtained so far might be put in the context of career guidance. Such guidance would attempt to remove or at least minimise person-job discrepancies, because it is recognised that not all potential trainee teachers will measure up completely to the psychological demands of teaching. Removal of person-job discrepancies can in principle be accomplished in three ways. The first involves some kind of compensation for individual differences through training. The second involves adapting the task to the individual, while the third approach involves attempting to choose the most suitable people using appropriate selection procedures. Of these approaches, the first amounts essentially, in the present context, to the actual process of teacher training (at least as far as the competence demands of teaching are concerned). The second is of limited applicability only, in so far as trainees can be advised to prepare for teaching in various types of school (First, Middle etc.). The third is the one to which the present results might make some small contribution as far as potential job-satisfaction is concerned. This contribution could function at any career-guidance stage, where individuals have options open to them for

various career-training commitments. The main occasions would be (a) when school students are attempting to decide their career choices, (b) when university students are coming up towards graduation and (c) when people dissatisfied with one career are contemplating a change of vocation, possibly to school teaching.

The guidance contribution would involve obtaining from any individual concerned, his Cattell (A, F, I and Q₁) factor scores, and then estimating his location on the J/S scale using the prediction equation given on page 117. Any advice based upon this result would be subject to two limitations. The first of these is the general limitation which applies in all selection testing and which is discussed at length on pp. 123-126. The magnitude of this limitation might best be communicated to a testee in terms of the 'forecasting efficiency' of this particular test battery (i.e. 23% - see p.118). The second limitation, which is frankly acknowledged at the present stage of this research, derives from the fact that the validation of the test battery as a predictor of teacher job-satisfaction has only been of the concurrent kind. It cannot be assumed that the results of a concurrent validation study can necessarily be directly transferred into a predictive validity model. This point is taken up in section 7.5 among a number of other suggestions for follow-up and development of this research.

The apparently rather negative findings concerning the relationship between personality structure and 'anticipated job-satisfaction' derived from the research involving teachers in training (see Section 5) do in fact have a positive aspect. Within the limitations imposed by the relative smallness of the size of the sample, it would appear that it is not possible to predict a trainee teacher's personal expectation of future job-satisfaction from his

personality characteristics. What can be done however, subject to the reservations discussed in the previous paragraph, is to estimate the degree of job-satisfaction he is likely to experience. The result of this estimation could be particularly useful when counselling a trainee teacher who is having, as so often happens, teaching-practice experiences of a kind which may be making him question his commitment to the continuation of his training.

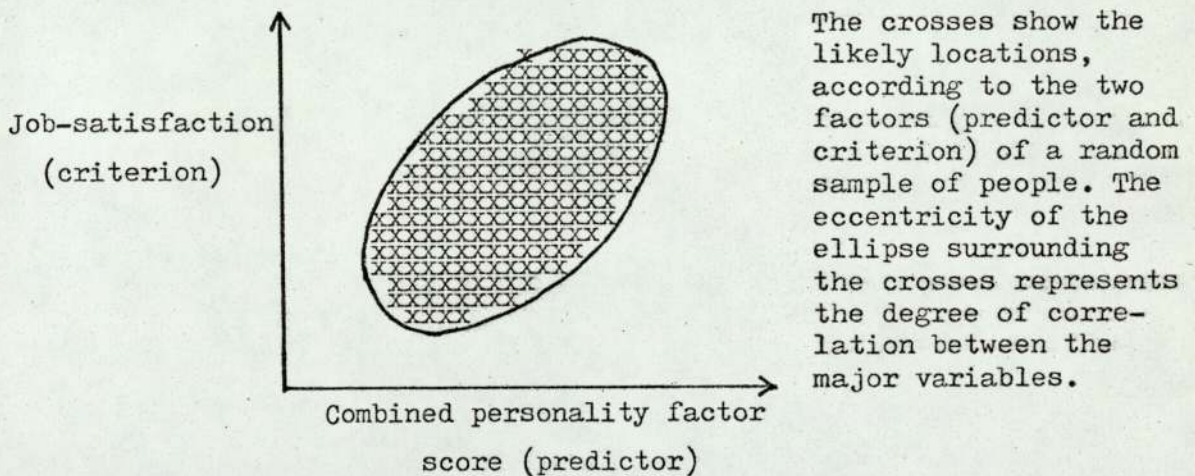
At the present stage, the various findings concerning the influence upon job-satisfaction of factors in the teacher's working environment probably cannot be put to use with too much confidence. Clarification and development of several of the issues is required. Suggestions in this respect are made in Section 7.5

7.4 Implications of these findings

The findings concerning personality factors and job-satisfaction have implications for the vocational counselling of those who are contemplating entry to the teaching profession, and for the selection procedures used by teacher-training institutions. The assessment of a person's location on each of the Cattell factors A, F, I and Q₁ will provide a basis for predicting that person's

location on a dimension of teacher job-satisfaction. The accuracy with which this prediction can be made has already been discussed, as also has the reduction in uncertainty provided by knowledge of the personality factor data. In point of fact, any approach to vocational guidance/selection based upon a knowledge of the correlation between some criterion and a set of predictors has to resolve some familiar psychometric decision problems. In the present case, the correlation between job-satisfaction (the criterion) and the weighted combined Cattell factor scores (the predictors) is less than +1.000 so that the scatter diagram of the criterion/predictor relationship will assume the form shown in Fig. 7.1 below.

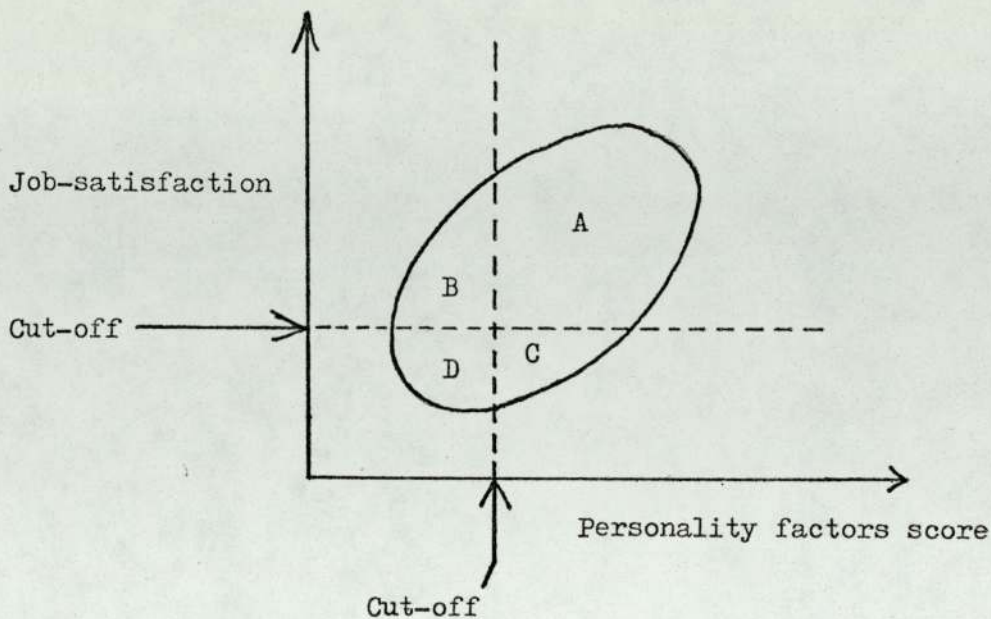
Fig. 7.1 Scatter diagram of relation between teacher job-satisfaction and teacher personality.



In order to make use of the known predictor/criterion relationship in vocational counselling or guidance, one would first have to decide upon the location of a 'cut-off' point on the J/S scale i.e. upon a lower limit below which the degree of job-satisfaction is unacceptable. Next, it would have to be decided what predictor score should be taken as the cut-off point in a selection procedure to separate those who should be advised to undertake teacher training from those who should be advised to do otherwise. These are difficult decisions to make. Suppose that the cut-off score for job-satisfaction

and the cut-off score for selection by personality factors are as shown in Fig. 7.2 below:

Fig. 7.2 Effect of location of cut-off scores upon selection for job-satisfaction using personality data.



The imaginary sample would be divided into four groups by the two 'cut-off' lines as follows:

- Group A - Acceptable level of job-satisfaction which is thus predicted by the personality factors score, (true positives)
- Group B - Acceptable level of job-satisfaction which is not thus predicted by the personality factors (false negatives).
- Group C - Unacceptable level of job-satisfaction, not predicted by personality factors score (false positives).
- Group D - Unacceptable level of job-satisfaction which is thus predicted by the personality factors (true negatives).

The members of Groups A and D can be regarded as 'hits' while those in Groups B and C are 'misses'.

If a suitable cut-off score for job-satisfaction could be assumed, one faces the dilemma that the larger one attempts to make Group D at the expense of Group C i.e. the more potentially unsatisfied teachers one catches in one's psychometric net by judicious location of the personality factors cut-off score, the smaller will be the

size of the resulting A Group in relation to the B Group i.e. the larger would be the number of people one would improperly counsel away from teacher training. A good compromise is difficult to achieve and efficient guidance/selection can only exist where there is a very high correlation between the predictors and the criterion. In the present case it would be imprudent to argue that guidance/selection decisions could be solely based upon assessments of people in terms of the four identifiable important Cattell personality factors, but it would be reasonable to propose that such personality factor data ought to be an important element in guiding such decisions. Goldman (1971), at the end of a comprehensive discussion of the use of tests in counselling, concludes that

"Used properly and intelligently, tests should be able to make a small but noticeable contribution to individuals who are seeking to find themselves and their place in the world."

The findings of the present research concerning the influence of factors in the teacher's working environment upon his degree of job-satisfaction have important implications for head-teachers and others involved in school management. It would appear to be fairly clear that school management procedures need to be geared towards the involvement of as many as possible of the school staff in the decision-making processes. The more a teacher feels he has a part to play in deciding, and to a certain extent controlling, what is going on within the school, the greater the degree of job-satisfaction he is likely to secure, and hopefully the more productive he will be in his work. No doubt, whenever those with 'paper' authority in schools both understand and act upon this principle, general morale and job-satisfaction will be at a high level.

7.4 Suggestions for follow-up and development

There are a number of worthwhile developments/elaborations of the research so far described. The first (and perhaps most obvious) follow-up would be an attempt to replicate the findings concerning the relationship between personality type and job-satisfaction. This could be done using the refined J/S scale described herein, by gathering data from a suitable random sample of serving teachers (say about 100), of the job-satisfaction they are experiencing and of their location on the Cattell personality factors A, F, I and Q_1 using the appropriate combinations of the scales in Forms A and B of the Cattell 16PF. The greater reliabilities of the Forms (A + B) combinations would be a distinct advantage in comparison with those of the short scales upon which the present conclusions are based.

The second possibility concerns the important question of test 'validity'. It has been assumed that valid scales of measurement of teacher job-satisfaction and trainee-teacher anticipated-job-satisfaction have been developed. These assumptions have been based partly upon the 'face validity' of the scale items and partly upon their within-scale homogeneity. It would be appropriate to validate them against an independent criterion by securing responses to both of the job-satisfaction scales described herein and to some other J/S scale (such as the Cornell Job-description index described in Section 2) from suitable samples of serving and trainee teachers.

A third and interesting area of development of the present research would be concerned with the specificity of the Cattell factors A, F, I and Q_1 to job-satisfaction within the teaching profession. It would be interesting to compare the predictive value of these factors for teacher job-satisfaction with their predictive value for job-satisfaction in other areas of employment. For this purpose a more general scale of measurement of job-satisfaction would need to be used.

A fourth possibility would be concerned with an empirical assessment of the predictive value of the four Cattell personality factors for teacher job-satisfaction. The procedure would require collection of the Cattell data from intending trainee teachers or from student teachers in the early stages of their training, and subsequent collection of job-satisfaction data from these same cohorts some years later when they had been working full-time as teachers for perhaps two years or more. A by-product of such a longitudinal study could be information concerning the stability over time of personality characteristics as measured by the Cattell 16PF scales.

A fifth, and most useful, area of development of the present work would be concerned with some kind of verification of the link between a teacher's degree of job-satisfaction and the extent to which he is involved in the decision-making processes within his school. This possibility was suggested in the previous section, where it was pointed out that there is clearly considerable scope for developing and using a much more substantial and comprehensive scale of measurement of teacher participation in, and responsibility for, decision-making within his school, than the one which was used here.

A sixth development, closely related to the fifth, would involve making between-school comparisons of the mean J/S scores of the teaching staff. Occasions where significant differences occur would provide useful sources of case-study material which would aid our understanding of the influence of within-school factors upon teacher morale.

Finally, it is suggested that teacher job-satisfaction could be investigated in relation to the motivational characteristics of teachers. One measurement instrument which might be used would be the Cattell Motivational Analysis Test (M.A.T.) devised by Cattell et al (1970). Any significant relationships derived from such an investigation might usefully broaden the range of 'personality' factors which contribute to vocational guidance/selection processes for intending teachers.

Section 8 References

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Table 9.1 List of Murray's Social Motives

Abasement: To submit to external force. To accept injury, blame, criticism, punishment. To surrender. To become resigned to fate. To admit inferiority, error, wrongdoing, or defeat. To confess and atone. To blame, belittle, or mutilate the self. To seek and enjoy pain, punishment, illness and misfortune.

Achievement: To accomplish something difficult. To master, manipulate or organize physical objects, human beings or ideas. To do this as rapidly and independently as possible. To overcome obstacles and attain a high standard. To excell oneself. To rival and surpass others. To increase self-regard by the successful exercise of talent.

Affiliation: To draw near and enjoyably co-operate or reciprocate with an allied other (an other who resembles the subject or who likes the subject). To please and win affection of a cathected object. To adhere and remain loyal to a friend.

Aggression: To overcome opposition forcefully. To fight. To revenge an injury. To attack, injure, or kill another. To oppose forcefully.

Autonomy: To get free, shake off restraint, break out of confinement. To resist coercion and restriction. To avoid or quit activities prescribed by domineering authorities. To be independent and free to act according to impulse. To be unattached, irresponsible. To defy convention

Counteraction: To master or make up for a failure by restriving. To obliterate a humiliation by resumed action. To overcome weaknesses, to repress fear. To efface a dishonor. To search for obstacles and difficulties to overcome. To maintain self-respect and pride on a high level.

Defendance: To defend the self against assault, criticism and blame. To conceal or justify a misdeed, failure or humiliation. To vindicate the ego.

Deference: To admire and support a superior. To praise, honor or eulogise. To yield eagerly to the influence of an allied other. To emulate an exemplar. To conform to custom.

Dominance: To control one's human environment. To influence or direct the behaviour of others by suggestion, seduction, persuasion or command. To dissuade, to restrain or prohibit.

Exhibition: To make an impression. To be seen and heard. To excite, amaze, fascinate, entertain, shock, intrigue, amuse or entice others.

Harmavoidance: To avoid pain, physical injury, illness and death. To escape from a dangerous situation. To take precautionary measures.

Infavoidance: To avoid humiliation. To quit embarrassing situations or to avoid conditions which may lead to belittlement, the scorn, derision or indifference of others. To refrain from action because of the fear of failure.

Table 9.1 continued

Nurturance: To give sympathy and gratify the needs of a helpless object: an infant or any object that is weak, disabled, tired, inexperienced, infirm, defeated, humiliated, lonely, dejected, sick, mentally confused. To assist an object in danger. To feed, help, support, console, protect, comfort, nurse, heal.

Order: To put things in order. To achieve cleanliness, arrangement, organization, balance, neatness, tidiness and precision.

Play: To act for "fun" without further purpose. To like to laugh and make jokes. To seek enjoyable relaxation from stress. To participate in games, sports, dancing, drinking parties, cards.

Rejection: To separate oneself from a negatively cathected object. To exclude, abandon, expel, or remain indifferent to an inferior object. To snub or jilt an object.

Sentience: To seek and enjoy sensuous impressions.

Sex: To form and further an erotic relationship. To have sexual intercourse.

Succorance: To have one's needs gratified by the sympathetic aid of an allied object. To be nursed, supported, sustained, surrounded, protected, loved, advised, guided, indulged, forgiven, consoled. To remain close to a devoted protector. To always have a supporter.

Understanding: To ask or answer general questions. To be interested in theory. To speculate, formulate, analyze and generalize.

Table 9.2 Personality factors investigated in relation to teacher
job-satisfaction

Eysenck Factor E (Extraversion)

Introvert (Inactive, non-sociable, careful, controlled, inhibited, reflective, responsible) versus Extravert (Active, sociable, risk-taking, impulsive, expressive, practical, irresponsible).

Eysenck Factor N (Neuroticism)

Stable Emotions (High self-esteem, happy, calm, casual, autonomous, healthy-feeling, guilt-free) versus Unstable Emotions (low self-esteem, depressed, anxious, obsessive, dependent, hypochondriac, guilt-prone).

Eysenck Factor T (Tough-Mindedness)

Tender-Minded (Peaceful, submissive, unambitious, empathetic, unadventurous, flexible, feminine) versus Tough-Minded (aggressive, assertive, ambitious, manipulating, sensation-seeking, dogmatic, masculine).

Table 9.2 continued

Cattell Factor A (Sizothymia/Affectothymia)

Reserved (detached, critical, aloof) versus Outgoing (warm-hearted, easy-going, participating)

Cattell Factor B (Lower/Higher scholastic mental capacity)

Less Intelligent (concrete thinking) versus More Intelligent (abstract thinking, bright).

Cattell Factor C (Lower/Higher ego strength)

Affected by Feelings (emotionally less stable, easily upset) versus Emotionally Stable (faces reality, calm, mature).

Cattell Factor E (Submissiveness/Dominance)

Humble (mild, accommodating, conforming) versus Assertive (aggressive, stubborn, competitive).

Cattell Factor F (Desurgency/Surgency)

Sober (prudent, serious, taciturn) versus Happy-go-Lucky (impulsively lively, gay, enthusiastic).

Cattell Factor G (Weaker/Stronger superego strength)

Expedient (disregards rules, feels few obligations) versus Conscientious (perservering, staid, moralistic).

Cattell Factor H (Threctia/Parmia)

Shy (restrained, timid, threat-sensitive) versus Venturesome (socially bold, uninhibited, spontaneous)

Cattell Factor I (Harria/Premisia)

Tough-Minded (self-reliant, realistic, no-nonsense) versus Tender-Minded (clinging, over-protective, sensitive)

Cattell Factor L (Alaxia/Protensian)

Trusting (adaptable, free of jealousy, easy to get along with) versus Suspicious (self-opinionated, hard to fool)

Cattell Factor M (Praxernia/Autia)

Practical (careful, conventional, regulated by external realities, proper) versus Imaginative (wrapped up in inner urgencies, careless of practical matters, bohemian)

Cattell Factor N (Artlessness/Shrewdness)

Forthright (natural, artless, unpretentious) versus Shrewd (calculating, worldly, penetrating)

Table 9.2 continued

Cattell Factor O (Untroubled Adequacy/Guilt Proneness)

Self-Assured (confident, serene) versus Apprehensive (self-reproaching, worrying, troubled)

Cattell Factor Q₁ (Conservatism/Radicalism)

Conservative (respecting established ideas, tolerant of traditional difficulties) versus Experimenting (liberal, analytical, free-thinking)

Cattell Factor Q₂ (Group Adherence/Self-Sufficiency)

Group-Dependent (A 'joiner' and sound follower) versus Self-Sufficient (prefers own decisions, resourceful)

Cattell Factor Q₃ (Low Integration/High Self-Concept Control)

Undisciplined Self-Conflict (follows own urges, careless of protocol) versus Controlled (socially precise, following self-image)

Cattell Factor Q₄ (Low/High Ergic Tension)

Relaxed (tranquil, unfrustrated) versus Tense (frustrated, driven, overwrought)

Source: Eysenck (1975) and Cattell (1962)

Table 9.3.1 Scores of 42 subjects on the first and second halves of the working version of the A.J.S. scale

17/23 22/19 21/21 22/23 14/19 20/20 20/17 17/22 14/21 16/18 14/15 17/16
 19/22 14/22 16/13 10/14 19/13 17/14 11/10 6/16 04/05 10/15 11/16 14/11
 10/13 13/10 12/21 12/13 18/26 30/26 25/25 23/22 18/26 27/28 24/25 25/25
 24/27 28/25 22/27 26/26

Table 9.3.2 Raw scores for each of 37 trainee teacher respondents on the A.J.S. scale and on each of 19 personality factor scales

27 132 200 170 01 11 11 10 07 19 11 17 11 18 08 15 13 17 14 14
 42 181 096 128 13 10 17 08 15 08 11 09 04 13 12 13 11 13 05 18
 42 219 040 178 11 13 21 14 16 11 23 10 02 11 05 05 10 12 16 05
 43 159 128 159 18 11 14 13 09 16 09 13 06 16 12 12 11 13 16 21
 48 152 155 203 10 11 14 10 13 14 14 11 06 14 11 12 13 13 13 15
 27 239 107 223 08 12 20 18 14 12 24 17 07 15 09 07 09 13 12 04
 50 219 054 180 11 11 19 17 18 11 19 12 08 16 14 04 14 06 09 04

Table 9.3.2 continued

32	264	164	216	13	07	12	20	21	16	23	16	12	18	06	14	09	08	07	13
38	147	087	148	12	11	14	10	16	14	07	17	04	20	12	08	13	09	12	17
45	205	129	222	08	08	12	22	08	13	10	06	14	12	08	14	04	20	11	19
36	193	144	153	10	08	09	11	20	12	12	17	09	18	10	10	11	15	11	18
20	233	075	179	11	10	17	16	16	05	12	13	07	19	05	09	14	12	05	08
41	185	125	136	10	07	24	05	09	07	06	18	04	16	08	02	12	17	07	08
48	149	068	108	15	12	16	13	12	11	09	10	05	22	10	07	10	07	14	14
40	217	185	208	06	11	06	14	16	04	13	18	09	20	06	10	12	11	07	24
34	204	089	161	13	06	15	09	14	04	13	18	10	20	11	08	13	18	09	09
40	163	130	235	05	10	18	16	17	10	11	11	08	14	08	06	07	15	14	07
26	198	133	201	07	10	13	13	10	11	11	05	13	13	08	10	06	11	10	15
20	192	134	226	11	09	15	17	19	12	20	07	09	15	06	10	10	12	08	10
46	137	118	155	08	11	17	09	04	15	06	09	04	16	11	08	05	17	16	10
31	168	104	114	15	12	18	12	08	13	14	17	02	19	11	08	07	08	17	15
40	145	138	166	12	09	15	09	12	15	04	17	08	12	08	11	11	12	12	17
33	205	114	131	09	10	16	13	24	10	18	16	07	09	11	08	07	12	14	15
34	180	204	198	07	09	11	16	15	09	17	16	12	15	06	07	08	12	08	16
28	154	066	118	14	10	22	09	18	15	14	16	00	15	13	05	07	10	15	05
45	214	090	145	10	10	16	07	12	12	09	11	00	16	17	09	03	14	16	10
44	212	091	204	12	09	18	13	14	06	22	08	02	19	04	03	07	03	10	04
35	189	130	208	11	08	18	16	18	11	20	15	11	18	04	07	11	10	11	05
27	217	227	236	12	05	13	15	18	10	13	09	08	09	07	13	10	11	08	11
38	205	122	197	12	08	17	11	20	13	23	11	10	07	09	12	13	12	11	20
51	207	043	211	09	11	21	18	18	08	19	12	10	15	04	06	16	11	12	07
46	310	056	185	15	09	20	24	19	03	25	17	18	17	09	12	10	13	09	13
21	192	043	158	11	12	21	14	06	13	18	14	07	14	13	01	09	15	15	04
39	240	113	122	12	08	09	08	10	10	08	18	14	08	10	16	07	12	11	23
52	180	090	158	10	08	15	11	13	11	15	13	09	15	09	05	05	11	10	09
44	147	133	231	07	09	13	12	08	12	10	11	10	15	08	07	11	18	16	11
40	226	153	195	11	09	13	15	18	09	16	04	07	13	07	12	10	14	04	20

The scores of each subject are shown in each row. In order, the scores listed are: A.J.S. - 2 digits. Eysenck Factors E, N and T - 3 digits each. Cattell Factors A, B etc to Q₄ - 2 digits each.

Table 9.3.3 Matrix of correlations between scores obtained on 16 Cattell personality factors from 37 trainee teachers

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
A		- + 087 276	+ - 276 010	- + 010 168	+ - 168 084	- + 084 105	+ + 105 054	+ - 054 234	- + 234 080	+ + 080 253	+ + 253 011	+ + 011 063	+ - 063 411	- - 411 018	- + 018 059	
B			+ + 258 018	+ - 018 251	- + 251 235	+ + 235 047	+ - 047 037	- - 037 403	+ + 403 204	+ + 204 223	- - 223 281	+ - 281 043	- + 043 183	+ - 183 509	- - 509 123	
C				+ + 019 020	+ - 020 106	- + 106 295	+ - 295 018	- - 018 412	- - 412 015	+ - 015 102	- - 102 648	+ - 648 063	- - 063 118	+ + 118 212	- - 212 731	
E					+ - 354 190	- + 190 611	+ - 611 185	- + 185 537	+ + 537 046	- - 046 437	+ - 437 093	+ + 093 026	- - 026 137	- - 137 229	- - 229 135	
F						- + 298 559	+ + 559 062	+ + 062 117	- - 117 122	- - 122 235	+ - 235 058	+ + 058 271	- - 271 392	- - 392 415	- - 415 035	
G							- - 208 032	- - 032 170	- - 170 147	+ + 147 300	+ + 300 209	- + 209 168	+ + 168 074	+ + 074 553	+ + 553 082	
H								- + 035 201	+ - 201 086	- - 086 335	- - 335 161	+ + 161 114	- - 114 366	- - 366 165	- - 165 366	
I									+ + 099 277	+ + 277 140	- - 140 068	+ + 068 247	+ + 247 001	+ + 001 010	+ + 010 041	
L										- - 164 355	+ + 355 455	+ + 455 118	+ + 118 242	- - 242 344	+ + 344 302	
M											- - 019 265	+ - 265 201	- - 201 210	- - 210 026	- - 026 187	
N												- - 029 231	+ + 231 129	+ + 129 399	+ + 399 079	
O													+ + 020 206	- - 206 227	+ + 227 729	
Q ₁														- - 063 294	+ + 294 010	
Q ₂															+ + 106 150	
Q ₃																- 176
Q ₄																

N.B. Each coefficient has been multiplied by 1000 and the direction of the correlation is indicated by the sign above each coefficient

Table 9.5 Scores based on various parts of the J/S questionnaire for serving teachers obtained by N = 231 respondents

001	112	61	173	61	51	057	116	56	172	62	54	145	131	56	187	66	65
002	124	58	182	68	56	058	126	55	181	61	65	146	133	58	191	68	65
003	131	55	186	71	60	059	113	62	165	60	53	147	141	64	205	71	70
004	100	57	157	49	51	060	122	55	177	58	64	148	112	51	163	62	50
005	119	52	171	58	61	061	132	54	186	67	65	149	109	55	164	47	62
006	082	49	131	41	41	062	128	60	188	63	65	150	137	59	196	69	68
007	103	55	158	54	49	063	143	52	195	70	73	151	080	56	136	43	37
008	128	56	184	66	62	064	130	66	196	71	59	152	114	56	170	51	63
009	099	47	146	54	45	065	100	59	159	56	44	153	115	58	173	53	62
010	129	59	188	65	64	066	114	47	161	63	51	154	123	62	185	65	58
011	130	56	186	68	52	067	143	58	201	70	73	155	086	57	143	44	42
012	110	53	163	55	55	068	087	48	135	44	43	156	136	60	196	73	63
013	088	50	138	46	42	101	127	64	191	66	61	157	124	59	183	61	63
014	113	56	169	66	47	102	133	64	197	66	77	158	098	61	167	49	49
015	120	52	172	66	54	103	130	63	193	68	62	159	117	60	177	50	67
016	113	57	170	59	54	104	135	57	192	69	48	160	121	59	180	61	60
017	120	61	181	65	55	105	122	58	180	64	58	161	108	49	157	56	48
018	114	68	182	60	54	106	121	61	182	61	60	162	119	65	184	60	59
019	104	59	163	57	47	107	140	62	202	73	67	163	108	54	162	54	54
020	104	57	161	49	55	108	108	50	158	54	54	164	125	54	179	64	61
021	105	53	158	57	48	109	078	56	134	33	45	165	082	54	136	43	39
022	126	66	192	68	58	110	136	60	196	70	66	166	103	62	165	52	51
023	145	65	210	74	71	111	116	58	174	59	57	167	120	57	177	63	57
024	136	58	194	63	73	112	119	60	179	65	54	168	098	58	156	44	54
025	130	52	182	63	67	113	129	52	181	62	67	169	112	56	168	55	57
026	137	60	197	72	65	114	117	62	179	54	63	170	121	60	181	59	62
027	120	65	185	57	63	115	131	63	194	70	61	171	117	64	181	57	60
028	098	53	151	46	52	116	124	64	188	64	60	172	113	54	167	62	51
029	119	66	185	54	65	117	121	55	176	63	58	173	102	60	162	56	46
030	144	65	209	75	69	118	101	54	155	52	49	174	123	67	190	59	64
031	135	50	185	59	76	119	102	54	156	51	51	175	114	55	169	60	54
032	139	53	192	71	68	120	127	55	182	65	62	176	120	57	177	57	63
033	119	48	167	60	59	121	095	54	149	52	43	177	119	60	179	53	66
034	088	51	139	55	33	122	083	56	139	43	40	178	126	51	177	59	67
035	122	59	181	66	56	123	116	60	176	51	65	179	126	70	196	59	67
036	129	63	192	67	62	124	111	62	173	59	52	180	097	56	153	48	49
037	133	58	191	64	69	125	138	63	201	71	67	181	142	60	202	71	71
038	132	61	193	69	63	126	133	58	191	70	63	182	127	59	186	61	66
039	129	63	192	67	62	127	126	64	190	61	63	183	116	59	175	60	56
040	116	71	187	60	56	128	095	50	145	49	46	184	138	64	202	72	66
041	135	69	204	69	66	129	113	50	163	55	58	185	127	59	186	68	59
042	053	49	102	28	25	130	115	58	173	60	55	186	128	64	192	67	61
043	117	59	166	52	55	131	099	51	150	50	49	187	142	57	199	71	71
044	111	58	169	54	57	132	079	55	134	35	44	188	127	63	190	69	58
045	109	60	169	57	52	133	110	52	162	58	52	189	137	63	200	70	67
046	139	64	203	71	68	134	093	55	178	45	48	190	133	63	196	66	67
047	131	59	190	69	62	135	122	52	164	58	64	191	128	64	192	66	62
048	138	66	204	67	71	136	125	62	187	65	60	192	133	56	189	70	63
049	138	58	196	70	68	137	117	58	175	61	56	193	123	61	184	62	61
050	119	57	176	62	57	138	110	55	165	50	60	194	112	56	168	49	63
051	093	56	149	53	40	139	104	65	169	54	50	195	125	53	178	73	52
052	134	57	191	70	64	140	131	62	193	66	65	196	118	70	188	59	59
053	133	56	189	69	63	141	100	58	158	50	50	197	109	52	161	58	51
054	131	57	188	72	59	142	108	59	167	50	58	198	097	53	150	49	48
055	096	59	155	41	55	143	103	58	161	50	53	199	083	61	144	47	36
056	066	44	110	34	32	144	111	56	167	55	56	200	126	67	193	59	67

Table 9.5 continued

201	105	62	167	56	49	222	114	53	167	56	58	243	069	57	126	35	34
202	136	58	194	73	63	223	125	59	184	62	63	244	109	57	166	51	58
203	095	58	153	64	31	224	122	64	186	58	64	245	115	57	172	53	62
204	124	55	179	63	61	225	110	64	174	61	40	246	132	57	189	65	67
205	117	66	183	52	65	226	122	60	182	59	63	247	111	54	165	54	57
206	110	53	163	55	55	227	127	49	176	61	66	248	105	61	166	53	52
207	108	59	167	55	53	228	145	63	208	73	72	249	079	50	129	53	26
208	102	57	159	52	50	229	139	64	203	72	67	250	100	57	157	49	51
209	110	55	165	60	50	230	115	52	167	67	48	251	092	56	148	45	47
210	093	53	146	53	40	231	114	55	169	62	52	252	102	56	158	56	46
211	117	65	182	56	61	232	126	65	191	59	67	253	130	57	187	67	63
212	124	60	184	59	65	233	127	64	191	66	61	254	128	68	196	64	64
213	087	56	143	47	40	234	132	61	193	70	62	255	122	50	172	64	58
214	105	54	159	49	56	235	101	64	165	58	43	256	110	56	166	55	55
215	112	55	167	53	59	236	128	57	185	65	63	257	085	57	142	48	37
216	091	57	148	48	43	237	133	62	195	61	72	258	111	56	167	61	50
217	106	52	158	50	56	238	140	57	197	67	73	259	104	56	160	55	49
218	109	52	161	56	53	239	130	54	184	65	65	260	087	52	139	40	47
219	124	48	172	69	55	240	119	47	166	62	57	261	102	55	157	58	44
220	108	60	168	55	53	241	126	56	182	59	67	262	110	58	168	57	53
221	132	60	192	67	65	242	126	56	182	59	67	263	113	50	163	56	57

Each row in each of the three columns shows for a given subject:

Subject code no. - 3 digits

Subject score on the 'accepted' 50 items of the J/S scale - 3 digits

Subject score on the 'rejected' 26 items of the scale - 2 digits

Subject score on all 76 items of the scale - 3 digits

Subject score on first half of the 'accepted' items - 2 digits

Subject score on second half of the 'accepted' items - 2 digits

Table 9.6 Responses of 231 subjects to questionnaire items 77 - 83

12132232	32222233	12123132	12123121	11123122	32111111
31212211	11123121	31112122	32322122	32122122	32121112
12123232	31212111	32122122	32122121	12233163	32122122
12133122	31122111	31132132	32221112	31132163	32131122
31312122	31132132	10133110	12323122	11133161	32212112
31232122	32322122	11233122	11123121	11133133	32232133
31231221	32212112	00000000	31113122	11133142	31132163
32111111	32111212	32121122	21222123	32132122	31122122
11133242	32132122	02133111	11123101	31132152	12133112
32232122	00000000	12133111	11122133	31133163	11123230
32112112	32131122	11223112	12123121	32222123	31132122
12231232	12122122	11123111	32111123	32211112	32121122
32012112	11133263	32121122	11113112	32121123	32112111
31132233	12132163	32122122	32111122	11133122	32111122
31132211	11133232	12123111	32122122	12113211	11323211
12133112	11223221	30011121	31133263	12133321	12212122
11223211	11133242	11123122	12133142	31122131	11133242
11133122	31131162	11123121	32132133	32111111	31332163
11123121	32231122	32132161	12033133	12223111	31122221
11213112	32211112	30022111	12123110	32223121	32132122
11233153	12222122	31123322	11123220	11323121	12133112
11133132	12122123	11123122	11113121	12223111	11223122
32111112	12113110	11223122	11123222	12223121	31222122
12123112	32121122	31132143	12113111	11123232	12123131
12113122	11133243	32211112	12213111	12113111	32221112
11123232	11213121	11113111	11213211	11323221	12123132
11133243	11213112	11113321	11123122	12023111	11123132
11133232	11223252	21112123	11133122	32233221	11323111
12133122	11122112	11123132	32131222	12133232	11123133
11213213	32112111	11123132	32012112	11133242	11123112
12213212	11122123	11123112	32221120	12133132	11122122
12233163	12133132	11123112	31122212	12323221	
11233122	32232163	32122122	32121132	11123221	
12123122	12223121	32212122	32222121	12213211	
32122222	12133132	12133163	32121222	12133130	
12132113	11133362	21132163	11133163	32112112	
12122132	12113111	12213112	32122122	32112121	
32211212	11113122	12123122	12223122	32121120	
32322112	12222122	11123120	11123163	32111212	
32211122	11123132	10133232	31132163	32211111	

Each row of each column indicates the responses of a given subject to items 77 - 83 in that order. For explanation of the coding see pp. 92-93.

The response to each item is coded by means of one digit. The subjects' case code numbers are not shown above but the first column lists the responses of subjects 001 to 040, the second column lists for subjects 041 to 068 and 101 to 112, the third for 113 to 152 etc. Missing responses are coded 0.

Fig. 9.1 Eysenck scale items to which serving teachers responded

Extraversion (E) Scale item nos.

002 004 006 007 011 017 018 020 021 023 024 030 037 038 042 043 048
049 051 052 054 055 058 062 063 068 070 075 076 077 079 082 085 088
089 093 095 104 106 107 108 111 113 115 116 117 119 120 123 141 143
146 147 148 152 155 156 157 158 162 173 180 183 187 189 192 199 200
207 209

Neuroticism (N) Scale item nos.

001 002 004 006 007 008 009 010 011 012 013 014 015 017 020 021 023
024 033 034 036 039 040 042 044 048 050 054 055 059 063 073 075 079
080 081 093 094 096 099 103 105 107 110 115 119 121 123 124 130 137
139 147 148 150 153 156 161 163 165 169 174 180 182 183 188 199 200
204 207

Tough-Mindedness (T) Scale item nos.

001 003 004 005 006 008 009 010 011 012 015 016 018 021 023 027 028
032 035 036 038 041 042 044 048 050 058 059 060 061 073 074 076 077
078 079 083 085 087 088 091 096 103 104 106 108 112 116 130 131 133
135 139 141 143 145 146 149 166 168 172 174 175 176 180 184 187 192
205 206

See pp. 107-108 and Eysenck & Wilson (1975)

Table 9.7 Raw scores for each of 68 serving teachers on the J/S scale
and on each of 19 personality factor scales.

01	112	061	041	060	14	10	12	13	15	16	18	16	06	12	10	10	08	10	10	17
02	124	057	031	053	08	11	13	06	08	13	13	16	04	19	09	08	03	15	13	12
03	131	049	031	045	10	11	17	06	07	16	05	18	06	17	12	13	08	17	17	18
04	100	076	046	057	10	10	08	11	14	05	13	16	09	17	15	15	09	10	09	22
05	119	053	081	096	08	06	05	14	11	17	17	15	08	16	05	17	08	10	09	24
06	082	091	022	071	03	08	15	16	18	07	16	11	12	17	12	04	11	17	11	13
07	103	050	021	058	09	11	12	06	12	15	03	08	06	16	06	08	08	19	15	07
08	128	047	016	045	08	10	12	07	06	10	05	17	06	16	12	11	08	18	13	11
09	099	063	021	064	09	12	20	10	05	11	09	06	06	18	09	08	13	14	14	10
10	129	073	042	059	11	09	16	14	13	14	14	17	14	16	10	06	13	18	17	18
11	130	055	036	034	16	09	13	07	09	14	19	12	10	13	11	11	04	13	18	12
12	110	046	059	037	09	09	09	03	07	18	07	09	06	10	07	17	07	17	18	18
13	088	091	044	070	11	11	13	19	15	04	16	15	10	18	08	07	17	12	07	11
14	113	087	016	060	06	11	20	13	18	08	18	12	03	14	06	08	07	12	10	05
15	120	055	055	066	02	08	11	15	14	12	11	11	10	14	10	15	09	15	11	15
16	113	067	056	062	12	10	08	17	15	12	19	16	10	16	10	12	07	11	11	19
17	120	090	017	080	15	12	17	15	20	12	17	13	12	12	08	05	16	12	08	12
18	114	098	005	062	10	08	22	17	11	13	20	16	07	14	08	07	12	07	13	03
19	104	054	021	052	11	09	21	10	07	16	14	06	03	12	06	08	08	15	16	04
20	104	070	056	088	08	09	09	10	12	12	18	07	09	15	11	13	08	09	10	21
21	105	060	062	069	09	08	13	12	09	15	14	13	11	18	11	17	07	16	12	17

Table 9.7 continued

22	126	076	020	069	13	11	18	12	17	11	22	08	07	08	16	11	04	11	13	12
23	145	051	017	058	13	09	22	14	11	18	18	09	04	16	08	03	08	12	17	03
24	136	052	034	044	14	08	14	07	13	07	07	18	05	18	13	07	15	13	15	16
25	130	057	030	051	09	08	15	12	09	13	09	13	04	08	16	14	04	14	15	15
26	137	054	020	068	14	09	13	10	12	18	14	12	05	18	12	07	16	12	19	08
27	120	077	026	112	13	09	15	21	13	16	23	10	14	14	09	05	15	10	17	14
28	098	047	039	033	06	12	11	07	02	10	01	04	09	12	12	14	11	11	10	13
29	119	086	018	069	16	10	18	17	12	10	21	11	07	23	10	08	08	08	10	07
30	144	076	020	084	12	11	13	20	23	18	22	08	10	11	13	09	10	08	15	10
31	135	064	042	058	10	10	12	14	13	10	17	20	12	16	06	17	08	12	10	21
32	139	075	020	058	12	11	23	04	13	14	20	10	05	12	12	06	03	13	14	09
33	119	044	060	054	05	11	15	08	09	16	03	11	06	12	04	12	03	13	17	15
34	088	048	071	058	06	10	13	12	06	19	06	12	13	14	06	16	11	08	10	18
35	122	056	060	046	08	09	16	07	13	14	04	12	07	11	10	14	09	15	14	15
36	129	058	040	052	08	11	12	15	09	11	17	09	05	13	10	05	02	14	06	15
37	133	044	058	049	08	10	13	07	11	17	14	17	04	18	13	14	05	10	09	19
38	132	048	038	056	12	08	12	11	15	11	03	14	11	14	09	13	08	12	10	19
39	129	092	019	070	09	08	10	18	15	06	11	13	12	09	14	14	08	17	06	20
40	116	069	024	093	04	09	15	14	10	13	20	11	13	12	11	10	13	11	12	13
41	135	097	045	078	09	12	13	11	19	11	17	12	10	18	09	12	08	11	11	15
42	053	079	008	111	08	08	17	20	12	14	20	00	14	17	05	08	16	11	16	12
43	107	073	033	075	08	12	09	11	14	15	05	04	10	08	11	11	09	13	10	13
44	111	066	018	065	11	08	16	12	10	14	11	08	12	09	08	07	05	11	08	15
45	109	067	024	057	10	10	16	13	06	10	08	09	02	06	10	04	05	12	11	07
46	139	098	040	063	13	07	13	11	18	13	15	18	12	22	12	12	09	12	07	13
47	131	058	046	054	13	11	17	08	17	15	18	20	09	14	12	12	06	10	10	24
48	138	065	082	056	10	09	08	09	16	12	09	14	03	11	12	16	08	13	11	24
49	138	078	019	033	16	11	14	03	04	11	07	15	02	13	18	06	04	11	15	07
50	119	075	015	070	06	08	20	22	09	09	10	10	12	15	09	05	13	13	08	06
51	093	050	064	028	07	11	13	04	06	14	04	17	04	16	14	15	06	14	14	20
52	134	083	039	068	14	11	13	20	17	12	23	16	13	20	04	12	13	07	08	16
53	133	073	023	083	11	08	15	15	17	09	19	15	09	17	07	08	12	13	16	19
54	131	047	045	064	09	12	11	12	06	10	12	19	10	16	11	07	04	20	13	18
55	096	044	044	071	11	07	17	09	04	18	08	12	11	15	13	15	06	17	17	18
56	066	060	084	060	05	11	06	13	10	10	07	12	11	12	09	22	17	16	13	14
57	116	076	032	078	07	10	12	19	10	09	15	08	09	15	10	12	04	12	13	16
58	126	070	051	054	14	12	13	09	12	12	20	14	13	18	11	13	14	08	14	16
59	113	040	023	049	12	09	21	14	10	13	08	15	06	12	17	06	06	15	18	04
60	122	078	046	031	11	11	15	11	15	12	16	16	10	10	08	12	06	10	11	18
61	132	058	046	046	10	09	20	12	12	14	19	16	06	12	10	09	02	14	12	10
62	128	084	026	055	11	11	14	15	19	06	14	12	07	16	04	07	11	06	06	08
63	143	076	020	067	12	10	19	15	14	10	16	12	08	12	08	09	06	06	12	11
64	130	083	034	083	13	10	18	18	18	18	25	10	10	10	08	17	09	12	16	20
65	100	070	048	073	09	08	11	12	12	12	18	13	08	19	09	14	03	10	15	17
66	114	063	032	056	09	10	19	10	06	16	08	12	07	17	13	10	13	18	14	08
67	143	081	010	079	12	10	16	17	22	09	20	06	14	16	04	07	07	08	07	18
68	087	074	027	075	11	12	21	15	19	15	16	13	06	18	09	03	07	09	18	04

The scores of each subject are shown in each row. The first two digits in each row denote the subject case number after which the scores listed in order are: J/S - 3 digits; Eysenck Factors E, N and T - 3 digits each; Cattell Factors A, B etc to Q₄ - 2 digits each.

Table 9.8 First and second half-test scores of 68 respondents on three Eysenck Personality Factor scales.

Extraversion (E) Scale

24/37	18/39	22/27	40/36	28/25	41/50	23/27	17/30	31/32	30/43
22/33	18/28	40/51	42/45	20/35	36/31	42/48	42/56	20/34	35/35
34/26	33/43	24/27	26/26	20/37	16/38	32/45	20/27	32/54	38/38
23/41	38/37	20/24	16/32	29/27	35/23	22/22	18/30	47/45	28/41
51/46	29/50	31/42	30/36	25/42	52/46	25/33	33/32	40/38	36/39
28/22	37/46	29/44	19/28	18/26	32/28	43/33	27/43	17/23	36/42
26/32	48/36	32/44	37/46	23/47	29/34	44/37	34/40		

Neuroticism (N) Scale

22/19	07/24	11/20	25/21	35/46	12/10	09/12	06/10	04/17	24/18
16/20	29/30	32/12	06/10	24/31	30/26	07/10	03/02	04/17	30/26
24/38	08/12	02/15	10/24	16/14	01/19	09/17	20/19	04/14	02/18
22/20	10/10	26/34	34/37	30/30	21/19	31/27	19/19	12/07	11/13
21/24	02/06	10/23	06/12	05/19	28/12	19/27	43/39	08/11	05/10
32/32	24/15	13/10	20/25	14/30	44/40	10/22	24/27	09/14	25/21
22/24	15/11	08/12	15/19	21/27	18/14	08/02	11/16		

Toughmindedness (T) Scale

27/33	31/22	22/23	34/23	50/46	32/39	37/21	25/20	32/32	32/27
16/18	19/18	34/36	25/35	34/22	27/35	35/45	36/26	24/28	43/45
37/32	31/38	33/25	28/16	30/21	32/36	60/52	19/14	35/34	41/43
28/30	26/32	31/23	28/30	15/31	28/24	26/23	26/30	25/45	46/47
39/39	57/54	43/32	34/31	29/28	30/33	22/32	23/33	13/20	37/33
12/16	37/31	41/42	32/32	37/34	28/32	36/42	27/27	24/25	13/18
20/26	26/29	34/33	39/44	51/22	22/34	43/36	40/35		

Table 9.9 Product-moment correlations between the scores of 68 respondents on three Eysenck personality factors.

Factor	Extraversion(E)	Neuroticism(N)	Tough-Mindedness(T)
E	1.000	- 0.379	+ 0.435
N	-	1.000	- 0.199
T	-	-	1.000

Table 9.10 Matrix of correlations between scores on 16 Cattell personality factors from 68 serving teachers.

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
A		+ 082	+ 229	- 002	+ 254	+ 096	+ 371	+ 210	- 049	+ 102	+ 127	- 278	- 037	- 327	+ 143	- 107
B			+ 049	- 180	+ 054	+ 112	+ 037	+ 048	+ 157	- 037	+ 023	- 132	- 010	- 115	- 059	- 155
C				+ 108	+ 015	+ 142	+ 217	- 129	- 192	- 029	- 032	- 587	- 029	- 065	+ 289	- 633
E					+ 459	- 241	+ 549	- 187	+ 514	+ 056	- 321	- 242	+ 382	- 337	- 289	- 110
F						- 205	+ 561	+ 060	+ 299	+ 063	- 223	- 131	+ 177	- 413	- 296	+ 100
G							- 006	- 109	- 094	- 127	- 050	+ 159	- 191	+ 062	+ 506	+ 008
H								- 004	+ 286	+ 180	- 210	- 221	+ 056	- 502	- 098	- 016
I									- 080	+ 306	+ 220	+ 165	- 094	+ 083	- 072	+ 313
L										+ 138	- 251	+ 157	+ 488	- 132	- 255	+ 342
M											- 151	- 084	+ 228	- 083	- 029	- 005
N												+ 046	- 228	+ 258	+ 168	+ 021
O													- 032	+ 072	- 076	+ 655
Q ₁														- 088	- 090	- 057
Q ₂															+ 310	+ 024
Q ₃																- 236
Q ₄																

N.B. Each coefficient has been multiplied by 1000 and the direction of the correlation is indicated by the sign above each coefficient.

Two-tailed 5% significance critical value is 0.240