

**COGNITIVE STYLE AND SOCIAL NEEDS
OF
ACADEMICALLY GIFTED CHILDREN**

by

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ABSTRACT.

Most departmental policy statements on the education of gifted and talented students recommend their retention, where possible, in mainstream classes in neighbourhood schools. The educational experience in such classes, of 14 students identified as academically gifted by their teachers, was investigated using a case study approach. Their cognitive style was studied by reference to information processing strategies as revealed in WISC-R subtest scores. Interpersonal and communication skills were investigated through classroom observation and structured interviews. The theories of deviance and authority were applied in interpreting this data.

Results indicated relationships between students' cognitive style and teachers' identification methods, and between students' cognitive style and their school satisfaction. Sex differences in teacher response and student interaction were also noted.

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CHAPTER 1. AN OVERVIEW.

1.1.INTRODUCTION.

In the past decade interest shown by educators in the gifted has sharpened considerably. As increasing numbers of teachers become aware of, and concerned about, this particular group of children school counsellors can expect to become involved, in a consultancy role, in the design of programs to meet their needs. In the A.C.T. this is particularly so, in the light of the expressed policy (1983) of the Schools Authority that wherever possible gifted children should remain in regular classrooms in their neighbourhood schools, where their abilities may be identified and developed. While many programs are now being established to supplement and enrich the education of these children, there is still little research on meeting their needs in the regular classroom. This study seeks therefore to address the experience of the academically gifted student in the neighbourhood school.

1.2.LITERATURE SEARCH.

A literature search revealed many articles listing characteristics of gifted children and covering such topics as level of abstractness of reasoning, problem solving strategies, convergent/divergent thinking, and the interaction between the affective domain and cognitive performance. Others describe the implementation of special educational programs. Ashman and Braggett (1983), drew many of these articles together under four headings

representing factors basic to the education of gifted children :- (a) the cognitive domain, (b) the affective domain, (c) human resources, and (d) physical resources. The latter two are largely a matter of funds and politics, but the former two are major facets of a child's development. As such they provide an organizing framework from which to study the educational experience of gifted children.

1.3. THE COGNITIVE DOMAIN.

The literature abounds in references to cognition but the great majority refer to manifestations of cognition in gifted children, (eg., level of reasoning, critical thinking), rather than information processing strategies - the cognitive processes involved when a student receives, remembers, analyses or synthesises information presented to him/her. In order to study these strategies it is necessary to choose an information processing model. The model chosen for this study is that of Das, Kirby and Jarman (1979), a model which is based on the empirical work of the neuropsychologist, A.R. Luria (1966, 1973, 1982), and which has already been applied in school settings. It consists of three dimensions :- simultaneous synthesis, successive synthesis, and planning. An outline of the model is included in the following chapter.

Studies have indicated that gifted children demonstrate a high degree of proficiency on the three dimensions, and that they may display a particularly high level of simultaneous synthesis (Jarman and Das, 1977; Kirby and Das, 1977). The education system, however, stresses successive synthesis resulting in a

possible mismatch for gifted students, should they have a preference for simultaneous processing. They could then be expected to feel bored, frustrated, and unchallenged, all aspects reported in the literature.

1.4.THE AFFECTIVE DOMAIN.

Gifted children's interpersonal and communication skills are often alluded to in the literature, but there are few studies of any consequence. There are many references to problems such as isolation, inability to interact with others, and lack of intellectual peers. If gifted children think differently, then it is possible that there is a connection between their cognitive style and their social relationships. Differences in cognitive style and ability level may constitute deviance within a classroom, and may also have implications for the authority structure of the classroom. Hence the theories of deviance and authority were included in the literature review.

1.5.FIELD STUDY DESIGN.

Having developed specific research questions from the literature, a case study approach was adopted, with an in depth study of the experience of a small number of students, identified as gifted by their classroom teachers. The case studies consisted of three strands :- (a) WISC-R tests were administered and profiles analysed, (b) classroom tasks and behaviour were observed, and (c) structured interviews were conducted with students, and separately with teachers.

1.6.RESULTS.

Results indicated some connections between the cognitive style and social needs of the students, with implications for changes in classroom structure and methods. Sex differences also emerged, again with implications for changes in classroom interaction patterns. Also evident was a preference of teachers identifying gifted students, for those who demonstrated high levels of ability in tasks associated with successive synthesis and social comprehension.

1.7.LIMITATIONS OF THE STUDY.

Because of the small population available in the A.C.T. it was not possible to deal with large numbers of gifted students, and thus to produce a study of statistical significance. Rather the study was designed as a pilot, from which indications for future large scale research may be drawn. For the small available sample size the case study approach allowed a large amount of information to be collected for each student, making the generation of further research questions possible.

1.8.CHAPTER OUTLINE.

Chapter 2 reviews the literature and develops the specific research questions addressed by the field study.

Chapter 3 outlines the field study design and methodology.

Chapters 4 and 5 report and discuss results, Chapter 4 dealing with results for the group as a whole, while Chapter 5 discusses differences in results between particular subgroups of the sample.

Chapter 6, the final chapter, summarises results and from them draws out key issues suggesting classroom changes, and directions for future research.

CHAPTER 2. LITERATURE REVIEW.

2.1.CURRENT POLICY AND PRACTICE.

A convenient reference point from which to begin a literature review on the educational experience of the gifted, is the official policy statements of the various educational authorities of Australia. The generally expressed view of these statements is that, where possible, gifted children should be catered for in the neighbourhood school. The A.C.T. policy, enunciated in 1983, is that gifted students i.e. "those possessing, to an outstanding degree, demonstrated competence or potential in intellectual, creative and/or other abilities" should "whenever possible ... remain in their neighbourhood school" (A.C.T. Schools Authority Bulletin, 1983, p. 5), where such abilities should be identified and developed. A review by Hughes et al (1984) of practices around Australia notes the existence of programs for those gifted in sporting and musical areas, some withdrawal programs for the intellectually gifted, cluster groups and mentor programs. However there is little report of strategies employed by teachers working with intellectually gifted children in regular classrooms.

2.2.CHARACTERISTICS OF GIFTED CHILDREN.

By reviewing the literature it is possible to build up a picture of the educational experience and many of the distinguishing characteristics of academically gifted students. There is a marked degree of consistency in the various descriptions of such students. Comerford (1980) and Grant (1983), for example, both report the gifted students' ability to think, reason, judge, invent and create.

Similarly Comerford's observation that gifted children have the ability to go from one activity to another without weakened attention is consistent with Freeman's finding (1979), in her work with the Gilbenkian Project in England that 56% of identified gifted children reported that they could pay attention to more than one thing at a time. Parents in this study rated their children high on independence, memory, and concentration, all of which are included in characteristics enumerated by Renzulli and Hartman (1971). Another of Renzulli and Hartman's characteristics, "Is easily bored with routine tasks", is consistent with Comerford's observation (1980) that gifted children demonstrate persistence in seeking alternative approaches to assigned tasks.

There is similar consistency in reports of gifted children's social adjustment. Hughes et al (1984), in their individual descriptions of seven gifted children report difficulty relating to peers for six of the seven. Such phrases as "experiences frustration and annoyance with peers", "prefers adult communication", "fails to get on with others", "makes comments beyond the comprehension of other children" appeared in teacher reports. This isolation from peers is raised by many others, several of whom connect this loneliness to estrangement from the same age group resulting in social alienation (Schauer, 1976; Zaffran and Colangelo, 1977; Ziv, 1979), and possibly self alienation (Neale, 1980).

2.3.AN ORGANISATIONAL FRAMEWORK.

An organisational framework for the studies referred to above, and the many others not specifically mentioned, is provided by Ashman and Braggett (1983). Their paper draws together the vast quantity of literature under four headings :- cognitive skills, interpersonal skills, human resources and physical resources. The latter two of these, while being essential to successful educational planning, are largely a matter of funding and politics, idiosyncratic to particular times and districts. The first two however are major facets of development with great relevance to dealing with gifted children in the classroom. In reviewing the literature on cognitive skills, Ashman and Braggett make the point that while there is a vast literature on the cognition of gifted children, most attention has been given to manifestations of cognition. While interest has been shown in the reasoning ability and critical thinking of gifted children, and programs have been developed to provide "something", a key aspect has been overlooked - how gifted children think. They suggest that activities for gifted children often focus on a specific problem or on a neglected skill while few, if any, focus upon children's information processing strategies. An examination of these strategies, together with an examination of social needs would be of considerable value in curriculum development.

2.3.1.An Information Processing Model.

In order to investigate the information processing strategies of gifted children, it is necessary to first adopt a theoretical approach to information processing. Possibilities are provided by the factor

analytic models such as those of Burt (1940), Vernon (1950), and Cattell (1971), Guilford's Structure of Intellect model (1967), the componential theory of Sternberg (1981), or the processes taxonomy approach of Houtz and Speedie (1978). The model of Das, Kirby and Jarman (1979), however, was chosen for this study for a combination of reasons.

Unlike the factor analytic models mentioned above, the Das et al model is not solely theoretical, but rather is based on the empirical observations of neuropsychology. It is heavily dependent on the work of Luria (1966, 1973, 1982), who developed an integrated model of brain function, by studying the effects of different types of brain lesions on behaviour. Moreover, Luria conceptualised higher mental functions as complex organized functional systems, which have their origins in social interaction, and whose development depend very closely on the social experience of the child. As this study is concerned with the links between cognitive style and social needs of gifted children, it is appropriate to choose an information processing model based on such a philosophy.

Further, the model has already been used to study learning and achievement of disabled and mentally retarded children, and normal children, and suggestions have been made for its applicability in school settings (Cummins and Das, 1978, 1980; Das and Molloy, 1975; Grabham, 1980; Hunt and Randhawa, 1983; Jarman and Das, 1977; Kirby, 1982; Kirby and Das, 1977; Kaufman and Kaufman, 1979; Leasak et al., 1982; Ransley, 1981; Ryckman, 1981). Thus, extension of its use to gifted children is a logical development. As a coding/planning model it is consistent with

observations of the intellectual activity of gifted children, whose rapid integration and evaluation of material seem to be evidence of coding efficiency and effective planning.

Das, Kirby and Jarmans' initial theory focussed on two types of information integration. Simultaneous synthesis involves the integration of the individual stimuli arriving at the brain into simultaneous and primarily spatial groups, and is linked to the parietal occipital area of the cortex. It is required in the formation of any holistic gestalt or in the discovery of relationships among two or more objects. Successive synthesis, linked to the fronto-temporal lesions of the cortex, integrates individual stimuli into temporally organised successive series. Examples of such synthesis include the automatization of skilled movement, rote memory and narrative speech. Since the model was first developed in 1975, a third dimension has come into equal prominence - that of planning. Intelligent behaviour cannot be limited to merely coding, to analysis and synthesis of sensory input, but also involves using the coded information consciously to attain a desired goal. 'Planning' is the term used to cover a system of functions involving the adoption of appropriate strategies to solve a problem, decisions as to whether or not actions have had the desired effect, and modifications of approach if the purpose was not served.

Das et al (1979) suggest that their model provides a new approach to achievement. They suggest that the constructs should be viewed as "dimensions of individual variation", and as such the model can be applied in an Aptitude X Treatment Interaction (ATI) fashion. "The processes perspective seems particularly

useful in understanding how individuals perform tasks, how they can be trained to do them more successfully, and how educational programs can be better designed to interact with individual differences" (p. 51). The ATI approach has similarly been described by Jensen (1970) as the "new hope of educational psychology" (p. 119), and has been demonstrated by others (eg. Cole and Scribner, 1974; Cronbach and Snow, 1977; Sharp et al., 1979) to be a valuable means of capitalizing on abilities to enhance achievement. However, as Jensen (op cit) observed, "a major problem that confronts researchers who wish to embark on investigations is the great question of which variables to pick on in hopes of finding educationally fruitful interactions" (p. 124). He suggests that the most valuable aspects to research are those that "involve relatively broad aspects of aptitude and instruction as contrasted with extreme task specific and individual specific interactions" (p. 125). Information processing approaches which have already had some application to above average and gifted children's thinking (Houtz and Speedie, (op cit); Sternberg, (op cit)), compare unfavourably in this regard with the parsimonious nature of Das et al's model. The three dimensions of their model offer the "relatively broad aspects of aptitude", to which Jensen refers.

The emphasis in this study was on the first two of these dimensions, not because the third is considered less important, but because pragmatically it was beyond the scope of a study of this size to address all three. Additionally, study of the two processing modes is made particularly relevant, in view of research which has linked high intelligence with high levels of simultaneous processing. Jarman and Das (1977) found that high

IQ groups differed markedly from middle and lower IQ groups on tests used to identify simultaneous synthesis and less on tests of successive synthesis. This is consistent with Luria's allusions to simultaneous synthesis being higher order processing (eg. 1973, p. 147). Other studies have linked simultaneous processing with achievement (Kirby and Das, 1978; Leasak et al, 1982), and simultaneous processing has also been shown to be more powerful in terms of incidental learning (Hunt, 1980). This concept of such cognitive processing being of a higher level, is similar to Jensen's Level I and Level II hierarchical abilities. Jensen described Level I ability as "essentially the capacity to receive or register stimuli, to store them, and to later recognise and recall the material with a high degree of fidelity" (1970, p. 155), with digit span (a marker test of successive synthesis), as one of its clearest examples. Level II ability "is characterised by transformation and manipulation of the stimulus prior to making the response" (p. 156). Raven's Progressive Matrices are said to depend heavily on this ability.

An ATI approach using the Das et al model has clear relevance to the frequent suggestion that gifted children, in particular, would benefit from a process oriented program (eg. Comerford, 1980; Grant, 1983; Ashman and Braggett, 1983), as would all children (Blachford, 1980; Ryan, 1982). The suggestion is that the teacher should become a facilitator, rather than a director of learning. Following the presentation of material at an exploratory level, students can then become involved in inquiry and discovery, with the learning process determined by the student. Teachers are then "learner participants" rather than "teacher participants",

teaching by example, and involving themselves in the learning process (Reid cited in Ryan, op cit, p. 142).

Several marker tests have been used by researchers to measure simultaneous and successive processing for particular individuals. Simultaneous tests include Raven's Coloured Progressive Matrices (1956), Figure Copying (Ilg and Ames, 1964), Memory-for-Designs (Graham and Kendall, 1960), Koh's Blocks and Link's Cube (Luria, 1973), and successive tests include Digit Span, Serial Recall, and tests of Visual Short Term Memory. However an alternative approach may be provided by the battery of subtests embodied in the WISC-R (Wechsler Intelligence Scale for Children-Revised) - a test already in frequent use by school counsellors. Research, summarised by Horn (1976), has consistently found two groups of subtests within the WISC-R, (Information, Similarities, Vocabulary and Comprehension comprising one group, and Picture Completion, Picture Arrangement, Block Design and Object Assembly the other), to measure different types of intelligence, variously described as crystallised/fluid, verbal/performance and verbal-educational/spatial-perceptual-practical. More recently the research of Cummins and Das (1980) has suggested links between these groups of WISC-R subtests and simultaneous and successive processing.

In a study with mentally retarded children, simultaneous processing correlated highly with the WISC-R factor, perceptual organisation (PO), and successive processing related significantly to the factor, verbal comprehension (VC). The subtests showing high loadings on the PO factor were Object Assembly (.85), Block Design (.78), Picture Completion (.64) and Picture Arrangement

(.62). Those loading highly on the VC factor were Vocabulary (.80), Similarities (.73), Information (.69) and Comprehension (.67). A similar factor structure emerged in Kaufman's study with non-retarded children (1975). While it is not possible to conclude from these separate correlations that the subtests measure simultaneous and successive processing directly, it does suggest that scores on these subtests could reveal differences between individuals' cognitive styles. To apply the WISC-R in this manner, to assist in recognition of different cognitive styles, would provide a link between the methodologies of psychometric studies and the cognitive information processing theories.

2.4. CLASSROOM INSTRUCTION METHODS AND THEIR IMPLICATIONS FOR GIFTED CHILDREN.

If these two constructs are viewed as "dimensions of individual variation", then it becomes relevant to ask to what extent are both dimensions explored in the classroom. The literature indicates that most classroom instruction operates at the knowledge/memory level, with few activities oriented to the higher levels (Bellack et al, 1966; Goodlad and Klein, 1974; Collis and Biggs, 1979), and successive synthesis stressed to the exclusion of simultaneous processing (Grabham, 1980).

If the education system ignores or neglects the simultaneous processing strategy, and students are denied the chance to employ their preferred cognitive style, then it may explain the boredom and frustration often reported as characteristic of gifted children (Ziv, 1979; Comerford, 1980; Renzulli, 1978). Nash (1980, cited in Grant, 1983) has found, for example, that gifted children

often answer questions at a higher level than that at which they are asked. Similarly this mismatch may explain why bright children are sometimes said to lack the basics. Jensen (1970) suggests that, as persons tend to use the abilities they have got, some will approach a Level I task as if it were a Level II task, resulting at times in poorer performance.

2.4.1.Deviance.

The possibility that the simultaneous mode has been largely overlooked can be linked to the literature on deviance and authority to provide an explanation for the social and interpersonal difficulties of the gifted, so often reported.

The literature on deviance is vast with many theories propounded. The interactionist model fits well with the observations of gifted children's experience, whose problems often seem to stem simply from being different from the norm. This approach distinguishes between primary deviance and secondary deviance. Primary deviance refers to those acts which cause someone to be labelled as deviant, while secondary deviance refers to the behaviours which are produced by being placed in a deviant situation. The critical variable is the social audience - ie. deviance is not inherent but is conferred upon those so perceived.

Two acts of primary deviance relevant to gifted children are outlined by Gove (1975) :- (a) being a member of a subgroup whose values violate the rules of the dominant group and (b) being placed in conflicting roles where adequacy in one may

produce violation in another. In a classroom a gifted child may be considered as a subgroup of one who understands lessons readily, who may want to explore the topic further, or try a different approach, who may not believe that the teacher knows more, or that the teacher's approach is necessarily the only, or correct one. Being studious may also throw the gifted child into role conflict, with expectations of appropriate behaviour varying between parents, teachers and classmates.

The secondary deviance of interaction theory - the adaptation to the overt and covert problems created by societal reaction to primary deviance, may be seen in the bright child in his/her adoption of the role of the little professor, or in classroom disruption, or in the devaluing of peers and their values (Hughes et al, 1984; Ziv 1979). The alternative is to cease being viewed as deviant by ceasing to perform deviant acts, and by conforming to the adoption of normal roles. For the gifted this means at least an overt denial of ability and its accompanying characteristics - ie "do not shine".

2.4.2. Authority.

One area in which gifted children's reactions may be deviant is in their reactions to teachers' authority. Stenhouse (1983) distinguishes between two types of authority held by teacher, (a) being an authority and (b) being in authority. A teacher is an authority by virtue of special competence, training or insight, whereas he or she is in authority by being a representative of a normative order or value system, which regulates behaviour

basically because of acceptance of it, on the part of those who comply.

Gifted children may call into question both these types of authority - the first by taxing the teacher's expertise, possibly knowing more than the teacher, or asking questions beyond the teacher's own level, and the second by critically questioning the validity of societal structure which has conferred authority on the teacher. Such a questioning of authority has great implications for the teacher's comfort and self esteem. Sociologists, Connell et al (1982), describe teaching as an "emotionally dangerous occupation" in which "authority becomes an extension of the self". To the extent that students resist, challenge or subvert teachers' authority, so they threaten them personally. Many teachers try to protect themselves and reduce their vulnerability by withdrawing themselves as far as possible. The mode of operation becomes "Keep your distance". Such a scenario may describe the position of some gifted children and their teachers. The teacher, whose authority is questioned may feel ill at ease, even unable to cope, and may withdraw from the student with overt or covert comments such as "if he is so smart he should be able to handle it".

2.5.IDENTIFICATION PROCEDURES.

In surveying the literature for identification procedures, the most notable feature is the lack of a uniform or clearcut method. This is consistent with the vagueness of definitions of gifted children, as revealed, for example, in the policy statements of the various Education Departments of the Australian states. All policy

statements refer in general terms to children of outstanding ability who have demonstrated high levels of performance or potential in one or more areas. Similarly, the identification of such children is seen as a multi-faceted procedure combining available information of various aspects of the child's development. Specific directives however are not given, only generalised guidelines.

In the wider literature a similar vagueness applies. Many articles discussing gifted children do not in fact address the question of identification at all. Such articles may describe the characteristics of gifted children, or suggest classroom strategies but do not at any stage outline exactly to which students they are referring (Comerford, 1980; Ziv, 1979).

A second group of articles, which may be grouped under the heading 'research reports', discuss giftedness purely in terms of IQ levels. A common cut off point is 120 (eg. Karnes, 1981; Henderson et al, 1982; McEwin and Cross, 1982), although others may be used depending on the purpose of the study (eg. Wright & Heater, 1981).

A much more comprehensive approach is advocated by those interested in designing particular programs for the gifted. The measures suggested generally include many or most of the following :- group IQ tests, general IQ tests, parent nomination, teacher nomination, self nomination, peer nomination, standardised achievement tests, questionnaires, observation diaries (eg. Hughes et al, 1984, pp. 64-65). The influence of Renzulli in identification is evident in such lists, as their

proponents endeavour to measure a variety of traits which Renzulli saw as comprising giftedness :- above average ability, creativity and task commitment (Renzulli, 1978). To assist peer, teacher and parent nomination, many scales have been developed to provide guidelines in trying to quantify characteristics. A widely used scale is that of Renzulli and Hartman (1971). The items for this scale were derived from the literature on gifted children at the time and cover learning, motivational, creativity and leadership characteristics. Various adaptations of the scale have been developed for use with specific groups and age levels. Renzulli et al's later approach to identification, the Revolving Door Model (1981), has also received a lot of attention among Australian educators. This approach suggests the use of two kinds of information :- status information and action information. Status information refers to the "objective and/or subjective knowledge about a child that can be gathered or recorded" (p. 648) while action information refers to "those dynamic interactions that take place when a student becomes inspired by a particular topic, area of study, issue, event, or form of creative expression" (p. 648). The latter information is considered essential to accurate identification of students with potential to benefit from supplementary services. However the authors note that the detection of such information requires "considerable sensitivity". Unfortunately no guidelines are given for teachers to develop the sensitivity, so that a key element in the success of such an approach to identification would seem to be the relationship and rapport between particular students and teachers, and the match/mismatch of their interests and cognitive styles.

Such a mismatch, or insensitivity to "action information" may underlie the research findings which indicate that teachers often fail to nominate as gifted, many children who are identified by other means (Barbe, 1965; Gear, 1976; Jacobs, 1971; Pagnato and Birch, 1959). It seems that teachers more readily nominate as gifted, those who belong to dominant cultural groups and who are already succeeding in the school setting. As such, it could be said that undue reliance is placed by teachers on status information, as they are not alert to factors constituting action information. In Cronbach's (1967) terms, the children identified, have an aptitude for success at school. Aptitude as defined by Cronbach "is a complex of personal characteristics that account for an individual end state after a particular educational treatment - ie. that determines what he learns, how much he learns or how rapidly he learns" (p. 23). Further an aptitude "includes whatever promotes the pupil's survival in a particular educational environment, and may have as much to do with styles of thought and personality variables as with the abilities covered in conventional tests" (pp. 23- 24). What, in this light, is the chance of a student whose cognitive style and personality is at odds with that of the teacher, of surviving in the classroom, of succeeding and of being recognised as gifted?

In essence then, there is little consensus on what means of identification should be used for gifted and talented students. In general, definitions and identification procedures seem tailored to particular programs. The program is designed first and identification procedures follow, to screen for students who fit the demands of the program. How many students of unrealised

potential remain undiscovered as a result is an unanswered question.

2.6. RESEARCH QUESTIONS.

In summary, the following research questions may be derived from the literature. The first relates to identification, the next three to cognitive style, and the latter three to social interaction, although there is some overlap along these two dimensions.

1. Identification.

Students identified as gifted by teachers are more likely to be those already demonstrating high levels of school achievement, and social comprehension.

2. Cognitive Style.

Since a high level of both simultaneous and successive processing is necessary for achievement, students identified as gifted will display high full scale WISC-R scores, and high scores on subtests linked with simultaneous and successive processing. The dominant processing style, however, will be successive, as proficiency in this mode is a prerequisite for school success.

3. Classroom Tasks and Assignments.

Classroom tasks, reflecting the emphasis on successive rather than simultaneous processing, will be set at the knowledge/memory level. Further, there will be little or no planning required of students, and no room for them to give higher level responses or to change from accepted methods of task completion.

4. Gifted Children's Response to Classroom Instruction.

As a result of being placed in such a learning environment gifted children and, particularly those who demonstrate higher levels of simultaneous processing than successive processing, will experience boredom, frustration and feel unchallenged. Given the opportunity, they would prefer to plan their own approach to classroom tasks and make greater use of simultaneous synthesis.

5. Teachers' Reactions to Gifted Students.

Teachers will find the presence of gifted children in the classroom to be threatening and may perceive a loss of authority and power. In order to maintain personal security teachers may in fact withdraw from gifted students rather than endeavour to meet their needs.

6. Social Experience of Gifted Children.

Gifted children experience feelings of loneliness and isolation as a result of lack of intellectual peers, and lack of satisfactory communication with peers. Communication with teachers may also be unsatisfactory due to factors outlined in Research Question 5.

7. Coping Strategies.

As a result of isolation from social groups and teacher withdrawal, gifted students may develop coping strategies in either of two directions :- (a) secondary deviance - behaviours which make them more atypical, or (b) a denial of their abilities in order to cease being classed as deviant.

It is these research questions which the field study seeks to address. The methodology of investigation is outlined in the following chapter.

CHAPTER 3. FIELD STUDY DESIGN.

3.1.COMPOSITION OF SAMPLE.

3.1.1.Sample Size.

The population for the field study was small ($n = 14$) for a combination of reasons. First, in the geographical area of Canberra, the school population is not large enough to provide a sample size of gifted children which would lend itself to a study of statistical significance. Second, the study was designed as an exploratory study, and, as such, required an indepth, case study approach which would reveal the connections between cognitive style, classroom experience and educational outcomes.

3.1.2.Age Range.

The age range of the sample was restricted to early adolescence - ie. 10-14 years. By this age cognitive processes are developed, but social development is in a period of rapid change. During this period peer acceptance becomes increasingly salient - it is important not to be different (McEwin and Cross, 1982). Differences may thus occur, over the years 10-14, in the number and kind of conflicts arising in interaction with teachers and peers, and in the students' perception of their experiences. Additionally this age range covers the transition from primary to high school, with associated changes in class structure and teacher-student relationships, as students move from dependency to independence. The comparatively intimate knowledge primary teachers may have of individual students aptitudes and

abilities may not be carried over into high school experience. Again it was expected that these differences may be reflected in student-teacher interactions, attitudes and relationships.

3.1.3. Identification.

In order to gather a population of students, school principals were contacted by telephone and asked for permission to work in their schools. A total of ten schools in various geographical locations around Canberra were contacted, with only one principal declining to be involved. Her expressed reason for non-involvement was that "quite definitely" no such gifted children were enrolled at the school. Other principals were happy for the study to proceed, turning the contact point over most often to the school counsellor. Three schools dropped out of the sample at this stage, by in two cases, neglecting to return further phone calls and in the third, the counsellor declined to pursue the study on the grounds that she was already receiving negative feedback from staff regarding other studies being undertaken at the school.

In the remaining six schools, three primary and three secondary, staff were asked to nominate students they felt to be of "outstanding academic ability". No more precise definition of academic giftedness was given. This open ended definition was employed, in order to be consistent with ACT policy which defines gifted students as "those possessing to an outstanding degree demonstrated competence or potential in intellectual, creative and/or other abilities" (p. 1), but more importantly to allow for different perceptions of giftedness to arise.

The resulting sample consisted of seven girls and seven boys from six schools - three primary and three high schools, for convenience, labelled A to F in the following discussion. The open-ended definition of giftedness given to staff resulted in some variation in methods used to identify suitable children for the study.

In primary school A the contact at the school was the librarian who had been co-ordinator of an extension program for bright children. She then discussed the project with Years 5 and 6 teachers who chose two children, a boy and girl, Chris and Katie, as being suitable for the study. Both were Year 5 students, chosen as high achievers who were also "divergent thinkers who don't take the teacher's word as gospel".

Primary school B had as its contact person, the school counsellor. No children had been referred or mentioned to her as being extremely bright. As a starting point she turned therefore to TOLA 6 scores, which revealed six names of students who scored above 125. These names were then given to the Years 5 and 6 teachers for their perusal. Several Year 5 names were added to the list by the Year 5 teacher. However in response to explanation that only the most outstanding students were being sought, the two teachers involved settled on four students - two boys and two girls - all from Year 6. One of the boys, Lewis - the highest scorer on the TOLA 6 - was included without question as being of outstanding ability, although he was also described as "slapdash" and "his handwriting leaves a lot to be desired." The second boy, Daryl, was also readily described as "gifted" and additionally as an interesting student, as he was from a large family and was

comparatively "a little deprived". Fiona was chosen as being "positive in all areas," and Kathy, because she was not a high performer but had scored surprisingly well on the TOLA. Her teachers welcomed the chance to receive more information on her ability.

At primary school C the school counsellor was also nominated as the contact person. She referred to a list of students, already identified as gifted by the staff, who had prepared the list in anticipation of the arrival of a resource teacher in the school. At the Years 5 and 6 level only two students, both boys, and brothers, had been identified. However, before choosing these students for this field study the school counsellor referred the matter to classroom teachers. At the Year 6 level the two teachers again began by scanning the TOLA 6 results and considering those with high scores. There was no doubt from either teacher that Tim P, the one Year 6 student already on the gifted list, was outstanding and must be included. However, there was then considerable discussion, and some disagreement, about other possible candidates. Several girls were mentioned - they were described as quiet, and possibly under-achieving. The male teacher acknowledged that boys "being more adventurous" were more likely to place themselves in positions where their talents become visible - for example by initiating discussions with teachers. Eventually the girls were not included because the teachers were not sure that the girls were of outstanding ability.

Further, more vigorous discussion arose between the male senior teacher and female teacher about three boys who had scored highly on the TOLA 6, but who were not performing highly in the

classroom. The female teacher, who had recently attended an inservice course on a program being developed for gifted children, strongly suspected that these three boys, all quite disruptive students, were very bright but under achieving. However the senior teacher remained unconvinced and the final decision was to nominate the one boy, Tim P, whom both agreed was an outstanding student.

The Year 5 teachers at school C made their choice much more quickly. A round table discussion quickly produced the consensus that there was only one really outstanding student - Jamie, brother of Tim P, and also one of the two on the school counsellor's original list.

School D, a high school, had as its contact person, a mathematics teacher, who had an interest in process learning. The contact person thus began by asking mathematics staff members to nominate outstanding students in Years 7 and 8. For Year 8 students, the name of one student, Bronwyn, was quickly produced by two teachers. The staff then turned to the NSW Mathematics Competition results of the previous year to jog their memories of other students. Several names were advanced without any definitive agreement among teachers. Thus it was decided to include only Bronwyn, the student initially mentioned.

The identification of Year 7 students presented the teachers with more difficulty. As it was early in the school year they felt they did not know the Year 7 students as well as the Year 8 students, and had no objective measure, such as the Mathematics Competition, as a starting point. The method therefore became one of teachers

nominating possible students, whose names were then checked by the year patron. She, in fact, had had no one mention any students to her as being very bright, but as a teacher of Year 7 could confirm others' opinions on some students. These students' names were then checked against TOLA results from Year 6, and primary school reports. The final list of students consisted of four students, two of whom were absent at the time. The final nominations were the remaining two - both boys - Tim W and Ben.

At schools E and F, the principals suggested that the best approach was for the researcher to address a staff meeting and invite teachers to nominate students. In school E no students were nominated, but the school counsellor was then asked for input. From a list of TOLA results, a Year 8 student, Angela was chosen, for her very high TOLA score. In school F, three teachers nominated students from three classes. The researcher decided to take two Year 8 girls from the top of the list to provide equal numbers of boys and girls in the study. However, the Assistant Principal (Curriculum) then insisted that the second should be replaced by another who had gained an outstanding report at the end of Year 7 - "one of the best the school had ever seen". Hence the two students from this school were Samantha, teacher nominated for being "quick to catch on, good assignments, insight into practical things", and Martine, nominated by the Assistant Principal on the basis of the outstanding achievement of the previous year.

3.2.EXPLORATION OF RESEARCH QUESTIONS.

Following the identification of students, the exploration of the remaining research questions involved three strands :- (a) an investigation of the cognitive style of each student, (b) observation of his/her classroom experiences, and (c) measurement of students' and teachers' desires, needs, responses to and perceptions of each other. These will be discussed in turn.

3.2.1.Cognitive Style.

To investigate the first research question it was necessary to make use of a psychometric tool which would measure level of ability and also indicate levels of simultaneous and successive processing. The Wechsler Intelligence Scale for Children - Revised (WISC-R) was chosen for this purpose. Several factors contributed to this choice.

First, the WISC-R is a psychometric tool already in common use by school counsellors and readily available to them. As a standardized test, the WISC-R is suitable for use with the small group involved in this study, for which, because of the group's small size, it is not feasible to obtain factor scores. Second, the research of Cummins and Das, (1980), as discussed in Chapter 2, has indicated that WISC-R subtest scores may indicate differences in style of processing for those with the same full scale score. Thus the WISC-R could be used to confirm or disconfirm the hypotheses arising from Research Question 2 (p. 21) on cognitive style, ie. that gifted children would score highly on tasks associated with simultaneous and successive processing, but that for the sample

identified by teachers the dominant mode would be successive. Using the WISC-R in this manner would enhance its value as a psychometric tool. By examining a profile of subtest scores in information processing terms, not only may a measure of intelligence be achieved, but also an understanding of individual cognitive style and therefore of how performance may be further encouraged and developed by appropriate process oriented programming.

To add to the information obtainable from the WISC-R, it was planned to also administer the supplementary subtests Digit Span and Mazes - Digit Span being recognised already as a marker test for successive processing, and Mazes, as a simultaneous processing task.

3.2.2. Classroom Experience.

To examine what happens in the classroom of a gifted child it is clearly necessary to observe the classroom in action. Interaction models such as Flanders' Interaction Analysis System were considered, but such models cover only samples of classroom experience and pinpoint specific behaviours. What was required for this study was comprehensive data on how the child spent his/her time in formal lessons, what was asked of the student, what he/she was required to do in assignments, what he/she did, what other's reactions to him/her were - ie. as complete a description as possible of student behaviour, variously called a Running Record (Irwin and Bushnell 1980) or Continuous Recording (Cooper 1981, Mash and Terdal 1976). Cooper recommends such records as being appropriate where there is a

need to "identify possible environmental conditions that set the occasion for student responses, and...to identify possible consequent events that maintain behaviours" (p. 40). This was indeed the aim of this strand of the field study - ie. to identify the classroom conditions impinging on the students involved and the effects that such experiences have on behaviours and learning outcomes.

An ABC chart format was adopted - ie. Antecedents - events occurring prior to behaviour, Behaviours - the student's responses to these antecedents, and Consequences - the events that follow the behaviour. Since consequences may also be antecedents a numbering system, used by Bijou, Peterson and Ault (1968) was also included. A time record was also kept, to indicate comparative length of various events. This system is more easily explained by reference to the accompanying example (Figure 1).

Observations were carried out, wherever possible, in two lessons for each student. Each student was observed in both a mathematics lesson and a humanities lesson. This allowed for different behaviours to arise with different teachers, and also different types of tasks to be set in different subject areas. For example anecdotal evidence suggested that Mathematics lessons may be more structured by the teacher than Humanities lessons, where students may be granted more freedom to pursue their own ideas and methods of approach.

FIGURE 1. CLASSROOM OBSERVATION RECORD.

Student: *John*

Date: *10/11/84*

Lesson: *Mathematics*

Time: *11.10am*

Time	Antecedent Events	Responses	Consequent Events
	<i>1. Teacher asks class for rule learnt yesterday.</i>	<i>2. John stares out of window.</i>	<i>3. Teacher : "Well, John?"</i>
	<i>3.</i>	<i>4. John shrugs.</i>	<i>5. Teacher : "Pay attention please!"</i>
	<i>5.</i>	<i>6. John faces blackboard.</i>	

3.2.3. Students' And Teachers' Perceptions Of Each Others' Behaviour.

While direct observation of the classroom can provide information on the structure of lessons, the teaching style and the students' responses, it cannot reveal the covert responses of student or the teacher. Hence in order to investigate more comprehensively the feelings and reactions outlined in Research Questions 4 - 7 (eg. boredom, loneliness for the student, loss of authority, feelings of inadequacy for the teacher), it was necessary to address these questions directly with the people involved. For this purpose a structured interview was conducted with each student, and the teacher or teachers observed in the classroom. The basis of this interview was an attitude questionnaire, completed in the presence of the researcher, and used as a basis for further questioning, where appropriate, or required. The questionnaire was "talked through" so choices could be qualified and explained.

The theoretical background for construction of the questionnaire came from the writing of Ajzen and Fishbein (1980), who identify two components of an attitude towards a behaviour - the person's belief that a behaviour leads to certain outcomes, and a belief that specific referents think he/she should or should not perform a behaviour - ie. salient outcomes and salient referents. To design a suitable attitude questionnaire it is necessary first to recognise these salient outcomes and referents so that they may be addressed in the questions.

For students the salient outcomes of appropriate school experience were identified as follows :- (a) school would be interesting, enjoyable and stimulating; (b) ability, talents and cognitive style would be recognised, valued and developed by teachers and peers; (c) social skills would be fostered and successful relationships formed with teachers and peers. Salient referents were identified as :- (a) peers, (b) teachers, (c) parents, with the order of importance possibly changing with age.

For teachers, salient outcomes of successful teaching were :- (a) the development of each student to his/her potential; (b) maintenance of authority and self esteem; (c) the development of a cohesive, productive class, where tasks are carried out smoothly and productively. Salient referents were :- (a) superiors, (b) students, (c) colleagues, (d) parents.

Using Osgood's semantic differential technique (1957), two questionnaires (Appendices I and II), one for students, one for teachers, were then designed, addressing each of the outcomes and referents for each group. There was some overlap between outcomes and referents in the questions as shown below :-

Student Questionnaire

Outcome (a)	Questions 1 and 2
Outcome (b)	Questions 2 and 6
Outcome (c)	Question 4
Referent (a)	Questions 3 and 4
Referent (b)	Questions 5 and 6
Referent (c)	Questions 7

Teacher Questionnaire

Outcome (a)	Questions 1 and 2
Outcome (b)	Questions 2 and 4
Outcome (c)	Questions 1 and 3
Referent (a)	Question 6
Referent (b)	Question 3
Referent (c)	Question 7
Referent (d)	Question 5.

The semantic difference technique allowed responses along each dimension of each question to be scored 1 to 7 from negative to positive, thus enabling total scores to be obtained for each question, and consequently comparisons to be made between students and between teachers.

By using the questionnaires as the basis for an interview it was ensured that all respondents were asked the same questions, but were not restricted to these questions. Responses were elaborated in the space provided after each question, or were discussed verbally, according to the preference of the respondents. When respondents were agreeable, interviews were recorded to allow conversation to flow, without the need to make notes on points of interest.

CHAPTER 4. RESULTS AND DISCUSSION.

Before discussing the results of the study, it is necessary to reiterate that it is a case study approach which allows for comprehensive data collection on individual students, but does not lend itself to rigorous statistical analysis. Nonetheless trends within the group, and between subgroups, are certainly indicated. Although the trends are clearly delineated and statistical analysis is unnecessary, the application of non-parametric statistical tests, where relevant, to these trends adds the extra information of formal levels of significance. Since non-parametric tests do not specify conditions about the parameters of the population from which the sample is drawn, and may be applied to very small samples, they are suitable for use in this study, while parametric statistical tests are not. The non-parametric Mann-Whitney U test, extensively applied in this study has power-efficiency approaching 95% for moderate size samples, and is therefore an excellent alternative to the t test, without the restrictive assumptions associated with the t test (Siegel, 1956). The Mann-Whitney U test requires that scores under analysis result from measurement in the strength only of an ordinal scale, not an interval scale as required with parametric tests. With results such as those concerning questionnaire responses this assumption of underlying continuity can be made, while that of an interval scale of measurement cannot. Where the following discussion is accompanied by figures outlining responses to questionnaires (eg. Figure 2 on page 48), the letters EQSNSQE refer to the adjectives extremely, quite, slightly, neither, slightly, quite, extremely as used in the questionnaires (Appendices I and II). The numbers 1-7 represent the scores

allocated to each of these categories, enabling a total on each dimension to be derived, and comparisons between total scores to be made where applicable.

The results of the study will be discussed under the headings of the research questions outlined at the end of Chapter 2. This chapter will discuss results for the group as a whole while the subsequent chapter will discuss differences between sub groups within the sample. It is in that discussion that statistical analysis is applied.

4.1.IDENTIFICATION.

The procedures used by school staff members to identify students have been outlined in the preceding chapter. In the terms of Renzulli's Revolving Door Model (1981) both types of information were used, but status information was notably more prevalent. For 12 of the 14 students involved, a high level of school achievement was a key factor in their nomination, coupled for 6 of the 12 with results of the group ability test (TOLA 6), or the externally set and marked NSW Mathematics Competition. The remaining two students were included on the basis of TOLA results alone.

Where action information was involved it was in a secondary, or confirmatory role, used to reduce the original list compiled on the basis of status information. Such action information was that used by the teachers of Katie and Chris who described them as "not taking the teacher's word as gospel", Samantha's science teacher who had noted that she was always "the first to catch on,

quick to see how instruments worked", and had "the best insight into practical things", and Tim P's class teacher, who had particularly enjoyed Tim's enthusiasm and flair for mechanical knowledge and applications.

The type of information used in identifying each student is summarised in Table 1. It indicates clearly the greater reliance placed on status information, and in particular, success at school. This is in agreement with the research referred to in Chapter 2 which indicated that teachers are more likely to nominate as gifted those who belong to the dominant cultural group, and who are already succeeding at school. All students in this study were from the dominant cultural group. The low reliance placed on action information indicates that those who do not have these characteristics are unlikely, or at least less likely, to be recognised as gifted.

4.2. WISC-R RESULTS.

All students had high full scale scores of 120 or above, which places them in the Superior range, as categorised by Wechsler (1974, p. 26). The median score of 133 is in the Very Superior range. Full scale, Verbal and Performance scores, along with subtest scores for each student are presented in Table 2.

Table 3 sets out range and median scores for subtests associated by Cummins & Das (1980) with simultaneous or successive processing. For ease of reference in the following discussion, scores on subtests associated with successive processing are described as 'successive' scores, and the subtests as 'successive'

TABLE 1. Procedures Used By School Staff To Identify Students Of Outstanding Intellectual Ability.

Student	Status Information		Action Information
	Test Results (TOLA, Maths)	High Level of School Achievement	
Girls			
Katie		X	X
Fiona	X	X	
Kathy	X		
Samantha		X	X
Angela	X		
Martine		X	
Bronwyn	X	X	
Boys			
Jamie		X	
Chris		X	X
Tim P.	X	X	X
Daryl	X	X	
Tim W.	X	X	
Lewis	X	X	
Ben		X	

TABLE 2. WISC-R Scores For Students Identified As Gifted.

Student	Age	F.S.	V/P	Inf	Sim	Arith	Vocab	Comp	D.S.	P.C.	P.A.	B.D.	O.A.	Cod	Mazes
Girls															
Katie	11.0	129	135/118	14	18	13	15	17	18	10	10	17	15	11	15
Fiona	11.8	120	120/114	13	13	15	13	13	13	11	10	16	9	14	n/a
Kathy	11.10	121	125/111	13	13	13	14	18	12	11	19	8	13	7	10
Samantha	12.9	135	141/121	12	19	15	18	18	15	15	2	14	15	19	18
Angela	13.1	128	128/121	12	13	17	15	16	12	8	14	16	14	13	12
Martine	13.2	125	122/123	10	16	15	11	16	10	10	15	13	14	14	14
Bronwyn	13.10	141	131/142	15	17	14	15	14	13	17	13	17	19	14	18
Medians		128	128/121	13	16	15	15	16	13	11	13	16	14	14	14.5
Boys															
Jamie	10.4	141	128/143	15	15	14	15	14	19	12	15	17	18	19	17
Chris	10.10	126	119/129	15	15	10	14	12	12	11	15	19	12	13	14
Tim P.	11.8	139	133/135	14	15	13	17	17	12	11	16	15	15	18	16
Daryl	12.2	137	136/130	12	17	14	16	19	9	15	14	14	14	14	9
Tim W.	12.4	135	139/124	16	17	16	16	15	12	11	14	15	14	13	12
Lewis	12.6	144	153/126	18	18	18	19	18	14	11	19	13	17	8	16
Ben	12.10	131	123/132	14	14	12	14	15	12	12	15	19	14	13	18
Medians		137	133/130	15	15	14	16	15	12	11	15	15	14	14	16
Girls & Boys															
Medians		133		14	15.5	14	15	16	12	11	14.5	15.5	14	13.5	15

TABLE 3. Range And Median For Scores On Subtests Related To Successive And Simultaneous Processing.

'Successive' Subtests	Low Value	High Value	Range	Median
Vocabulary	11	19	8	15
Similarities	13	19	6	15.5
Information	10	18	8	14
Comprehension	12	19	7	16

'Simultaneous' Subtests	Low Value	High Value	Range	Median
Object Assembly	9	19	10	14
Block Design	8	19	11	15.5
Picture Arrangement	2	19	17	14.5
Picture Completion	8	15	7	11

subtests. Similarly scores on subtests associated with simultaneous processing are termed 'simultaneous' scores and the subtests as 'simultaneous' subtests. These terms are intended to suggest only that an indication of cognitive style has been achieved, and are not intended to imply that a direct measure of information processing has been obtained.

Table 3 reveals several noteworthy results for 'successive' and 'simultaneous' subtests. In the standardisation sample for the WISC-R the mean score for each student is 10, with a standard deviation of 3 (Wechsler, *op cit*, p. 25). Thus on all tests associated with successive processing the median is greater than one standard deviation above the mean. This is consistent with the hypothesis that students identified as gifted by teachers, would demonstrate a high level of proficiency in tasks associated with successive processing, resulting in an aptitude, in Cronbach's terms (1967) for school success.

The median scores for 3 of the 4 tests associated with simultaneous processing are also greater than one standard deviation above the mean, but are slightly lower than the median 'successive' scores. In addition the range for 'successive' scores is narrower than for 'simultaneous' scores. These results are in accord with the second hypothesis that students would display high full scale scores, and high scores on 'successive' and 'simultaneous' subtests, but with the dominant mode being 'successive'.

The highest median subtest score (16) was for Comprehension, a subtest often seen as a measure of social understanding and

degree of social compliance (Jacobson and Kovalinsky, 1976; Sattler, 1982). The high score indicates, perhaps, that teachers are more likely to identify as gifted those who demonstrate knowledge and understanding of the social code. Such an aptitude would predispose teachers to feel more positive towards and thus interact more with such students, resulting in more attention being paid to their abilities and achievements.

In an education system in which teacher assessment plays an increasing role in assessment of performance and potential, this trend raises a disturbing question. Are students of high ability and potential, but whose cognitive style is at odds with teachers' preferred style, likely to be realistically assessed, or will their contributions and potential be continually undervalued and unrecognised?

While the dominant processing mode for the group as a whole is successive this is not so for each individual student. A comparison of the total scores for the two subtests most strongly associated with successive processing, (Similarities and Vocabulary) with that for the two subtests most strongly associated with simultaneous processing (Block Design and Object Assembly) is presented in Table 4. Clearly the majority of students perform more strongly on 'successive' subtests, as shown by a positive difference and as expected in the light of results discussed above. Some students, however, demonstrate a superiority on tasks associated with simultaneous processing. The results and experiences for these students, are discussed in comparison to those demonstrating superiority on tasks associated with successive processing, in the following chapter.

TABLE 4. Comparison Of Totals On 2 Subtests Associated With Successive And Simultaneous Processing.

Student	Successive Sim + Vocab	Simultaneous B.D. + O.A.	Difference
Girls			
Katie	33	32	+ 1
Fiona	26	25	+ 1
Kathy	27	21	+ 6
Samantha	37	29	+ 8
Angela	28	30	-2
Martine	27	27	0
Bronwyn	32	36	-4
Boys			
Jamie	30	35	-5
Chris	29	31	-2
Tim P.	32	30	+ 2
Daryl	33	28	+ 5
Tim W.	33	29	+ 4
Lewis	37	30	+ 7
Ben	28	33	-5

Examination of WISC-R scores also reveals several sex differences. These will also be discussed , along with sex differences in other results, in Chapter 5.

4.3.CLASSROOM TASKS.

All but two of the lessons observed were tightly teacher directed. The exceptions were a process writing lesson in which students were free to write a story of their own choice, and a language lesson, in which the student being observed was given permission to write a computer program, as he had completed set work earlier. In each of the other lessons students were required to follow explicit directions from the teacher on what to do, and how it should be done. Very little self direction or planning was required, and in no lesson observed was there any room for higher level responses, as outlined by Collis and Biggs (1980). This restraining teaching style perhaps explains the marked emphasis on status information in identification. By carefully proscribing responses, teachers in fact close themselves off from any chance of availing themselves of action information, by which they may recognise students' unique responses, enthusiasms and abilities. Students, especially those who do not demonstrate a high degree of social compliance, thus have no avenues through which they may reveal their flair.

4.4.RESPONSE OF GIFTED CHILDREN TO SCHOOL EXPERIENCE.

The responses to Question 1 of the Student Questionnaire indicated that most students under observation believed school to be quite interesting, quite enjoyable, at least slightly rewarding,

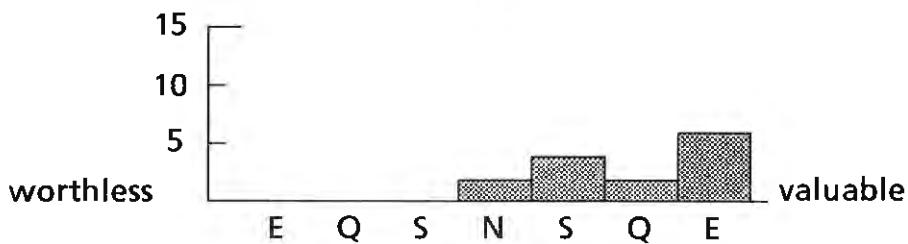
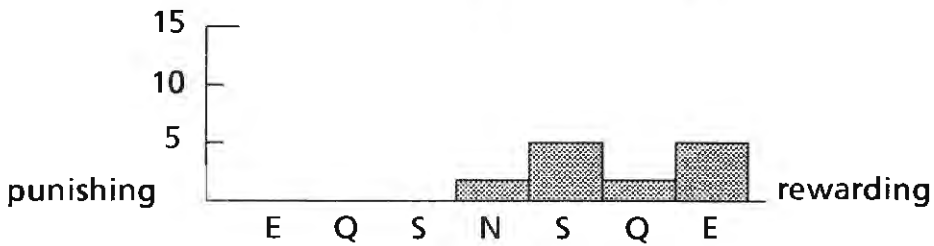
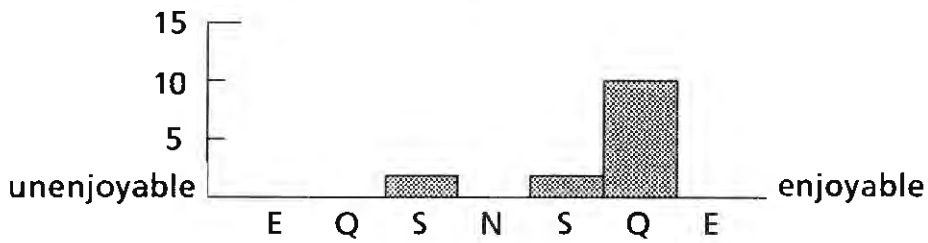
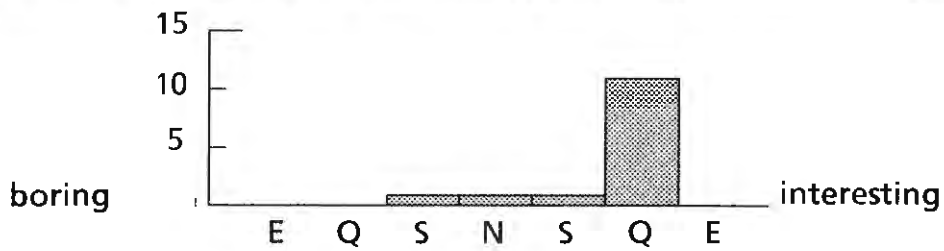
and often an extremely valuable place to be (Figure 2). However elaboration of answers often revealed reasons for these responses to be separate from the educational experience itself. Many students mentioned the presence of their friends as the reason for school being enjoyable and interesting. The rewards and value of school were most often explained in terms of needing an education for future employment or future education. A typical response was :- "It's quite enjoyable as you get to see your friends as well as doing the subjects...[It's extremely] rewarding because you do learn things and you are going to need them later on so it's better if you go...It's valuable when you want to get a job" (Bronwyn). In contrast two of the students who gave the response "slightly rewarding" qualified their answers as follows :- "Slightly rewarding but not very - there's no sense of achievement when you catch on quickly", (Angela), and "only slightly rewarding, there's no sense in having achieved something other than your best work. What I like best is when I don't understand something, and then read it over and think 'Great! -I understand it!'", (Samantha). These sentiments were expressed more negatively by Jamie and Ben, who felt they "got nothing out of it".

The comparatively positive view of the group as a whole on "being at school" was not carried through into views on school tasks and assignments. (It was explained during the interviews that the word 'assignments' in the questionnaire, was intended to encompass all assigned school tasks, both in the classroom and at home.) As students elaborated on their questionnaire responses, several points of view emerged. Katie and Samantha expressed

FIGURE 2 Responses To Question 1, Student Questionnaire.

Being at school, is for me -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
boring	0	0	1	1	1	11	0	interesting	78
unenjoyable	0	0	2	0	2	10	0	enjoyable	76
punishing	0	0	0	2	5	2	5	rewarding	78
worthless	0	0	0	2	4	2	6	valuable	82

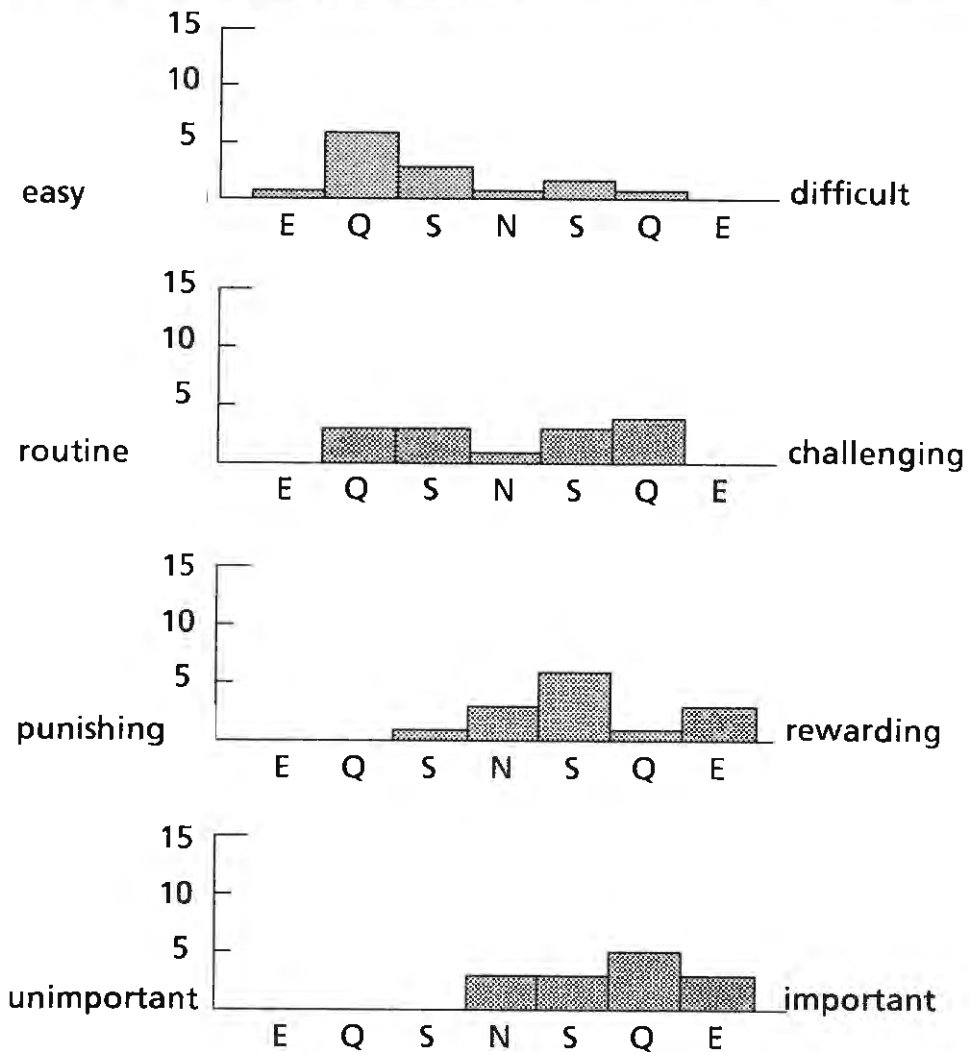


boredom :- "school assignments are predictable and therefore boring" (Katie); "Sometimes boring - just doing it to see if we can do it - very straightforward" (Samantha), while Daryl and Tim W both resented time filling tasks :- "Assignments are quite easy but I reckon it's a waste of time. Most of the Maths problems are just to fill in time. I prefer things when you go and do it, because you actually get it first hand" (Daryl); "Sometimes work is just time filling - I like subjects when you actually do something" (Tim W.). A similar preference was expressed by Bronwyn, who classified assignments on the whole as "quite routine" and preferred assignments "where you have to put more work in like research on a famous mathematician". Lewis designated assignments as being quite challenging but his explanation put him more in line with those who found them routine and boring - "...challenging because it's easy to do them but it's hard to bring myself to do them...I'd rather read". In keeping with his views on being at school, Jamie saw no value in assignments and gained nothing from them - "School assignments are not important - you just write down all the things you know and then you forget about them. They just fill in time. They're set to learn things from them, but I don't". The reason for this was possibly given by Ben who said "School assignments have to be slightly difficult to learn anything". As Figure 3 indicates, only one student rated assignments more than slightly difficult, with the majority finding them easy. While responses were evenly divided between challenging and routine at least one (Lewis's, quoted above) could be reclassified to the other end of the scale, giving a majority classifying school tasks as routine.

FIGURE 3. Responses To Question 2, Student Questionnaire.

School assignments are, on the whole -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
easy	1	6	3	1	2	1	0	difficult	42
routine	0	3	3	1	3	4	0	challenging	58
punishing	0	0	1	3	6	1	3	rewarding	72
unimportant	0	0	0	3	3	5	3	important	78



The lack of challenge and resulting boredom were reflected in classroom observation records. Table 5 indicates that of 11 "not on task" recordings, other than social conversation, 10 were indicative of boredom. Of 23 "failure to obey instructions" recordings, 13 occurred when students continued working after the class was asked by the teacher to attend as a whole to an explanation or answer. Apparently the students felt they did not need to attend, as the problems under discussion were not causing them any difficulty.

In apparent contradiction to the classification of assignments as easy and routine, they were also judged to be rewarding and valuable. However, when reasons were given they were again not intrinsic to the task itself but more in terms of necessity for "an education" and future employment. Lewis, for example, rated them as extremely rewarding "because you get a sense of achievement on finishing", and quite important because "when you grow up and go to college you've got to do assignments there". Martine, choosing 'extremely important' explained that "you need to do it to get a good mark".

An interesting sidelight on these perceptions was given by three of the high school teachers, in two different schools, who mentioned, while talking about the students involved in this study, that they were more concerned about extremely able Year 10 students who were now totally "switched off" and "sour" towards school. One student was described as "a real problem to cater for, as she's bored silly in some subjects". A possible explanation for this apparent discrepancy between age groups, is that by Year 10 students have become less convinced about the

TABLE 5. Instances Of Students Not Being On Task.

Student	No. of Occasions Recorded 'Not On Task'	Social Conversation	Other	Comments
Girls				
Katie	0	0	0	
Fiona	1	1	0	
Kathy	7	7	0	
Samantha	6	5	1	laughing
Angela	5	5	0	
Martine	2	1	1	rocks chair
Bronwyn	1	0	1	fiddles
Sub-Total	22	19	1	
Boys				
Jamie	2	0	2	looks at computer, stares out window
Chris	1	0	1	talks about base 3
Tim P.	2	1	1	talks about Maths in Language
Daryl	2	1	1	writes story in Maths
Tim W.	2	2	0	
Lewis	2	1	1	reads science book
Ben	4	2	2	looks out window, fiddles
Sub-Total	15	7	8	
Total	37	26	11	

long term relevance of their school experience to education and employment, and correspondingly less convinced about its intrinsic value. Some differences were evident in this area for students who scored highly on 'simultaneous' subtests. These are discussed in Chapter 5.

4.5. TEACHERS' RESPONSE TO GIFTED STUDENTS.

Contrary to expectations there were very few occasions (4 only), during the classroom observation strand of the study, on which students disagreed overtly or corrected the teacher. Further, two of these occasions were simple cases of drawing the teacher's attention to minor errors, such as numbering, in work set out on the blackboard. Hence very little questioning of the teacher's competence and authority was observed. In addition, in none of the classes observed were the students under observation notably disruptive, even in those classes where general student behaviour was non-cooperative. The only instances approaching disruption were "laughing and joking" (Tim W) and "rocking chair" (Martine). Of course the presence of the observer may have curtailed disruption but in later interviews with teachers, it was confirmed that observed student behaviour was consistent with normal behaviour. In summary, there were extremely few occasions noted when the authority of the teacher, either that invested in him/her by society, or that achieved by expertise, was called into question. No threat to the personal security of the teacher was obvious.

One can speculate that the explanation for this low profile maintained by the students, is that they are intelligent enough to

recognise that it is unproductive to be too questioning in the authoritarian environment of the school. An alternative explanation is that those who do question, will not be identified as gifted anyway, because of their perceived lack of appropriate social conduct.

Teachers' responses to items on the teacher questionnaire, dealing with the difficulties of catering for the students, and the students' effect on them personally (Questions 1 and 4), were consistent with the observations of little threat to personal security. In general teachers reported feeling neither strong nor weak, and more relaxed and comfortable than otherwise, about having a particular student in their class. (Figure 4). The two exceptions to this were Jamie's class teacher (primary school) and Tim W's maths teacher (high school). Jamie's teacher, Mr M, found it quite easy to cater for Jamie because he was so undemanding, but was slightly tense about having him in the class because he often wondered "what can I do for him that I'm not doing?" Additionally, Mr M had noticed that Jamie's interest and enthusiasm had dissipated over the school year, but was unsure why. Tim's teacher, Mr P, reported feeling slightly tense and uneasy for a combination of reasons. First, unlike the majority of the teachers (Figure 5), he found catering for Tim to be quite difficult. This was because Tim was "very quick off the mark, always searching for more work to do". He was a "quite rewarding" student but "not extremely - because he uncovers my own inefficiency in the system...I prepare work for the midstream and just above. He is well above, not the only one, but he's the one who seems to make the most noise about it". Popular with his peers, Tim was inclined to joke and laugh with his neighbours,

FIGURE 4. Responses To Question 4, Teacher Questionnaire.

Having him/her in my class leaves me feeling -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
weak	0	0	0	15	1	7	2	strong	121
tense	0	0	2	5	2	8	8	relaxed	140
uneasy	0	0	1	4	3	10	7	comfortable	143

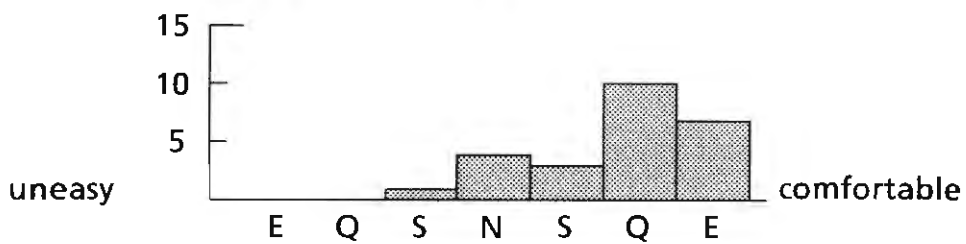
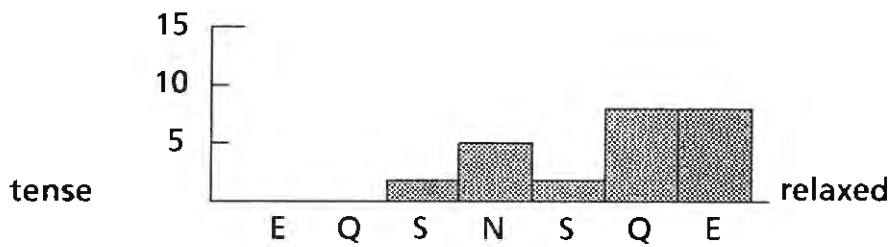
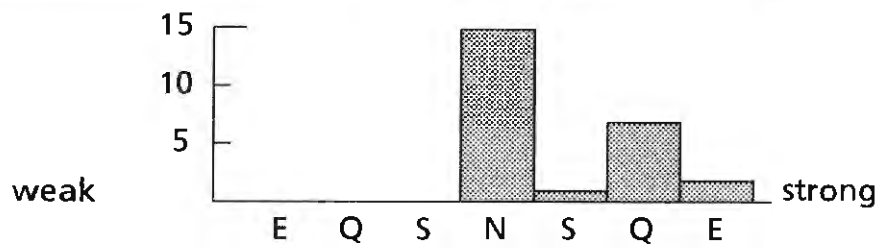
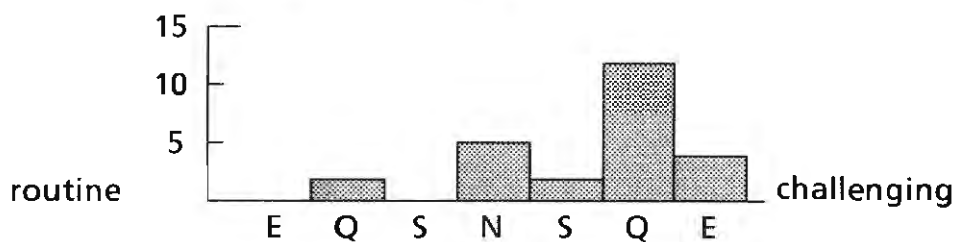
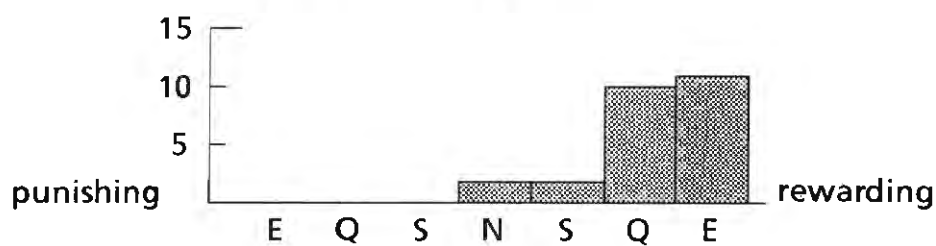
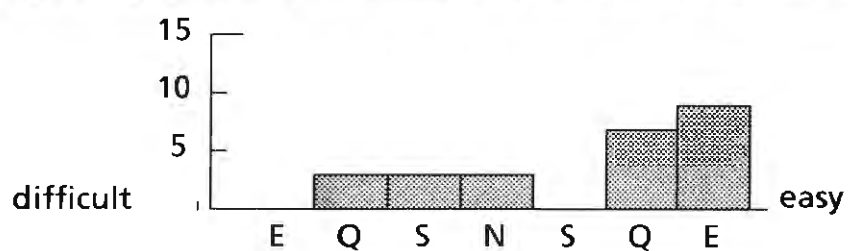


FIGURE 5. Responses To Question 1, Teacher Questionnaire.

To cater for him/her in my class is -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
difficult	0	3	3	3	0	7	9	easy	132
punishing	0	0	0	2	2	10	11	rewarding	155
routine	0	2	0	5	2	12	4	challenging	134



especially when he ran out of work. This classroom behaviour was noted by the observer (see reference to Tim W above in discussion of disruption), and Tim alluded to it himself when he mentioned that he did not like maths, and so was inclined to "stir". Mr P also felt that Tim was inclined to dominate class discussion - "Sometimes I think he could give the other kids a chance".

These comments from Mr P point to a possible connection between the frequency of student contributions, and teacher comfort. Many teachers stated that the student involved contributed, in general, very little. Where this was the case they also reported (with the exception of Jamie's teacher, outlined above) feeling quite relaxed and comfortable, or totally unaffected, and found catering for the student at least quite easy eg. Mr J said of Kathy "It is easy to cater for Kathy because she is so understanding...She doesn't contribute anything...She leaves me feeling extremely strong, extremely relaxed and extremely comfortable". Similarly, Mr B said of Bronwyn "She is easy to cater for, because we have Maths extensions...She doesn't contribute much...doesn't affect me either way". In talking about Ben, Mr O said "He is quite easy to cater for...doesn't make many contributions...leaves me feeling quite relaxed and comfortable", while Mr P, who found Tim W disconcerting, described catering for Ben as neither easy nor difficult, adding that he "doesn't contribute much, although what he does is more original than Tim", and reported feeling relaxed and comfortable. It seems that Ben, a more original thinker, but one who does not say much, is less threatening than Tim W, who is more outspoken.

For those like Tim W, who contributed more in class, there was often some diminution in the comfort of teachers and less ease in catering for them. Mr J's statement about teaching Lewis, for example, may be compared with that quoted about Kathy, who was in the same class. Of Lewis, Mr J said "The ideal is difficult to cater for, but in fact you just ignore his extra ability...His contributions are quite valuable, extremely original...slightly pleasing...he leaves me feeling quite strong, neither relaxed nor tense, quite comfortable". While Mr J was still comfortable, Lewis clearly had a quite different effect on him from Kathy.

Samantha was described by Mrs G as being easy to cater for, making few contributions, and left Mrs G feeling neither strong nor weak, but extremely relaxed and quite comfortable. In contrast, Mrs G found catering for Martine to be quite difficult. Martine made "more contributions than Samantha" which were "often negative" and left Mrs G feeling only slightly relaxed, slightly strong and slightly comfortable. Martine's mathematics teacher, Mr L, an Assistant Principal, found it quite easy to program for her by the provision of extension topics, and was "quite relaxed and comfortable" with her in class. He reported, however, that she contributed quite a lot in class, and "could be cheeky - I think when she's bored". As a result he suggested that she could put less experienced teachers under pressure. A similar perception of the importance of experience was given by Mrs P talking about Katie. Mrs P, a teacher of many years experience, found Katie easy to cater for, reported that she made valuable contributions, and left Mrs P feeling relaxed and comfortable. However, Mrs P added, "I feel that I have sufficient rapport with Katie for her to relate to me but she could make some teachers

feel inadequate". Mr P, the teacher quoted as feeling inadequate with Tim W, was in fact a first year teacher. In summary, the trend seems to be that the more a student contributes in class, the less likely it is that the teacher will feel very relaxed and comfortable, especially less experienced teachers.

Again, one can speculate that many of the students have recognised the connection, consciously or otherwise, themselves. In classrooms where deviation from set ways of doing things is discouraged the student would have to choose between a possible loss of favour with teachers, if they express unusual or alternative opinions, and the dissatisfaction of remaining silent otherwise. Perhaps the disenchantment of Year 10 students, discussed earlier, can also be explained in this manner. By Year 10 are such students tired of continually making such choices in which neither outcome is completely satisfactory?

Allied to the possible connection between level of student contribution and teacher comfort are the results of the classroom observation strand of the study which revealed very little interaction between the students under observation and their teachers. In fact the most notable initial impression for the observer was how little impact the students had on the teacher and vice versa. Of the 14 lessons observed there were only 11 recordings of teacher initiated interaction, other than asking for answers in response to answers being volunteered. In this category, there were 5 requests for answers from 31 offers (Table 6). The low incidence of interaction could be construed as withdrawal by teachers to protect personal security. The less interaction is initiated the fewer contributions are made by students, and so the greater teacher comfort.

TABLE 6. Interaction With Teacher (Total From Two Lessons).

Student	Volunteers Answer	Asked For Answer	Teacher Initiated Interaction
Girls			
Katie	0	0	0
Fiona	6	1	0
Kathy	2	0	0
Samantha	0	0	1
Angela	0	0	0
Martine	4	1	0
Bronwyn	2	1	0
Sub-Total	14	3	1
Boys			
Jamie	1	0	1
Chris	4	0	1
Tim P.	1	0	3
Daryl	3	0	2
Tim W.	7	2	2
Lewis	1	0	1
Ben	0	0	1
Sub-Total	17	2	11
Total	31	5	12

Alternatively it could simply be that these children were left alone in the belief that they could and would get on with the work themselves. As discussed earlier, none of these students could be described as disruptive, and as Mr J said in reference to Fiona "in fact you don't devote attention to the well behaved. You gear your lessons to those who make noise". While it may be that these particular students were self motivated enough to work conscientiously, it is also true that in having little interaction with the teacher they were not being extended, and teachers may have remained unaware of their interests and abilities which could be carried further. Interestingly Tim P, the student who experienced most teacher interaction, was also one of the students most satisfied with his school experience. His teacher, Mr W, said of him "Tim is easy to cater for - he comes out with the problems. I'm just the facilitator...While he doesn't say much in class he will come to me later...I enjoy having him there and find him a stimulation". Perhaps the amount of interest a teacher shows by interacting with a student in class is related to the student's willingness and confidence to approach the teacher for additional information and assistance. In view of Luria's proposition that cognitive development depends on social interaction, this lack of interaction, whatever its cause, carries with it the implication that gifted students are thereby not given the opportunity to fully develop their cognitive potential.

Sex differences, differences between primary and high school teachers, and differences for students who scored highly on 'simultaneous' subtests in this area of teacher reaction, will be discussed in Chapter 5.

4.6.INTERPERSONAL RELATIONSHIPS AND COMMUNICATION IN THE CLASSROOM.

4.6.1.Perceived Peer Response.

Classroom observation did not reveal any obvious isolation of gifted children, in that no student sat on his/her own and most had at least one or two regular companions. In addition, though occasions of teacher-initiated interaction were few, there were many instances of interaction with other students. As reference to Table 6 reveals, the majority of occasions categorised as 'not on task' occurred when students were engaged in social conversation. These were equally split between conversation initiated by the observed student, and those initiated by others. Another notable cause of student interaction was requests by classmates for assistance. This was more prevalent among girls and especially in mathematics lessons (Table 7). Of the 16 teachers involved in the study, 10 were male, and all mathematics teachers were male. Whether this was related to girls being asked more often for help in mathematics, usually by other girls, but also by boys, is not clear. One wonders whether females give clearer explanations than males. It would be interesting to observe mathematics lessons taught by a female teacher, to see whether the same phenomenon arose. In all, there were 42 instances of student-initiated interaction compared to 12 instances of teacher-initiated interaction.

While there was no directly observed isolation, student's responses to questionnaire items did indicate varying degrees of perceived acceptance by peers. Two questions on the Student

TABLE 7. Student Initiated Interaction.

Student	A - Requests For Help			B - Conversation	Total A + B
	Maths	Humanities	Sub-Total		
Girls					
Katie	4	2	6	0	
Fiona	0	0	0	1	
Kathy	0	1	1	3	
Samantha	6	0	6	2	
Angela	1	0	1	3	
Martine	2	0	2	1	
Bronwyn	3	0	3	0	
Sub-Total	16	3	19	10	29
Boys					
Jamie	2	0	2	0	
Chris	0	0	0	0	
Tim P.	0	5	5	0	
Daryl	0	0	0	1	
Tim W.	1	0	1	1	
Lewis	0	0	0	0	
Ben	2	0	2	1	
Sub-Total	5	5	10	3	13
Total	21	8	29	13	42

Questionnaire (Questions 2 and 3) and one on the Teacher Questionnaire (Question 3) were designed to address peer group relationships in the classroom. The students' questions covered peer group attitudes to school, and classmates' reactions to students' contributions in class. The teachers' question concerned classmates' feelings about having the student as a member of the class.

Responses from the students indicated that in general they perceived classmates as believing that school success was at least slightly important, but not quite so valuable (Figure 6). Again elaboration of answers was revealing. Lewis expressed the view that "Most of the kids think what they are learning is of use, except the brainy ones...they think it is useless", while Tim P stated forcefully what many others also mentioned. While rating the overall view as quite important and quite valuable, he added "Some think it's a waste of time. They lounge around and do nothing...it's revolting". The students were certainly aware that several classmates did not place high value on schooling.

Students' perceptions of how classmates viewed their contributions were generally positive (Figure 7). While all students perceived that their contributions were viewed as at least neutral to good, and neutral to valuable, there were less positive perceptions for the scales interesting/uninteresting and pleasing/annoying. Elaboration of answers explained this either in terms of lack of interest in the students' answers - while they were quite good and valuable, others really did not care very much - or in some cases resentment. Angela, for example, remarked "most of the class are just not interested - they don't

FIGURE 6. Responses To Question 3, Student Questionnaire.

My classmates consider school success to be -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
unimportant	0	1	0	0	5	7	1	important	76
worthless	0	1	1	3	4	5	0	valuable	67

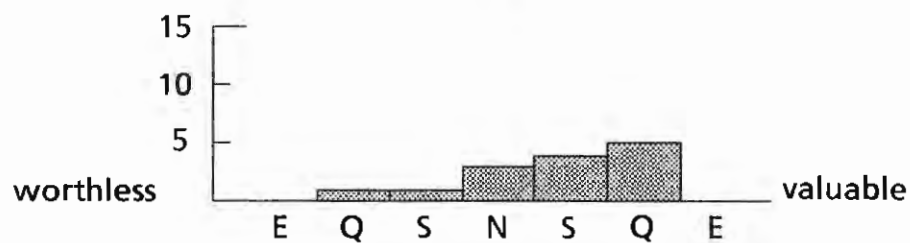
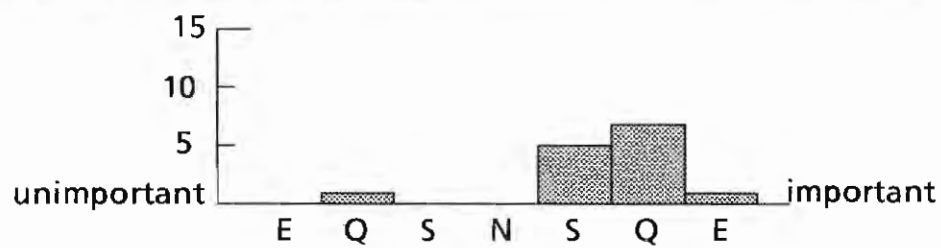
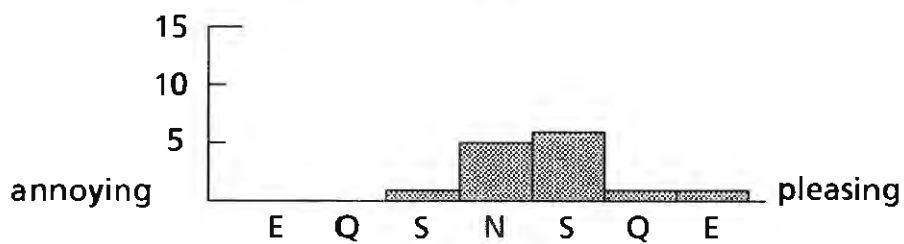
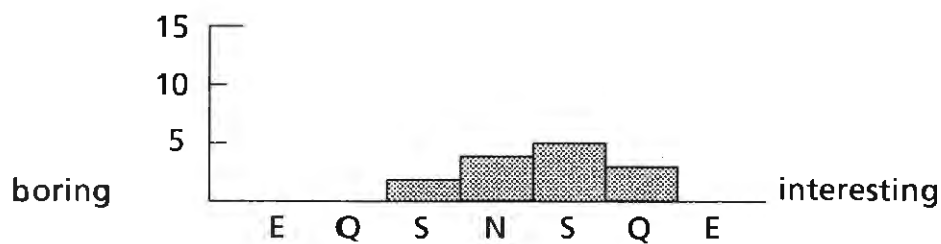
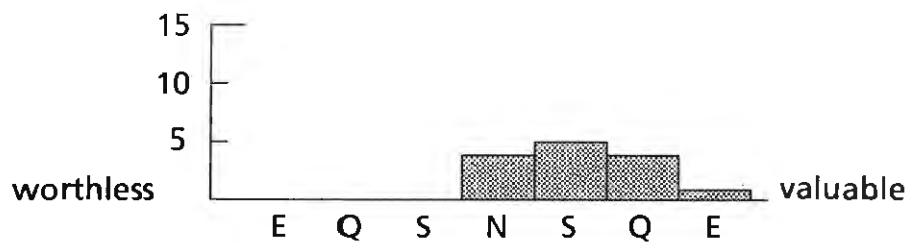
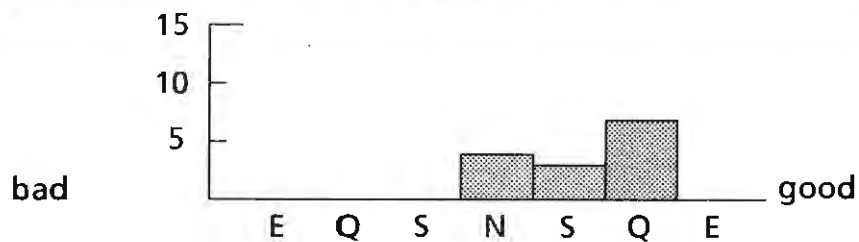


FIGURE 7. Responses To Question 4, Student Questionnaire.

Classmates consider my contributions in class to be -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
bad	0	0	0	4	3	7	0	good	73
worthless	0	0	0	4	5	4	1	valuable	72
boring	0	0	2	4	5	3	0	interesting	65
annoying	0	0	1	5	6	1	1	pleasing	66



care". Daryl also experienced difficulty in gaining students' interest :- "Most would listen, but some would say 'shut up'...quite valuable if they would listen to me", while Lewis experienced more than disinterest "some are quite resentful about them".

More significant perhaps than these answers were the asides made by several students, and confirmed by teachers' comments, that they did not, in fact, make many contributions. For some this was apparently not a conscious decision, for example Martine said "I don't say much in class - I don't know why", while for others it was a deliberate policy. Samantha, for example, reported that her contributions were seen as slightly good, valuable and pleasing, but neither interesting or boring, and added "I don't annoy them because I don't say anything unless they ask me. I'm fairly quiet in class. If I get a good mark they say 'Square!, Square!' I don't like it". Teachers also alluded on several occasions to the decision by students not to stand out. Fiona's language teacher, for example, stated that Fiona "hides her light - doesn't have much to say". Similarly Tim P's teacher felt that Tim was one of the group but added "in a group he chooses not to stand out - is more likely to come to me afterwards".

Several teachers mentioned that while the students may not have been particularly popular, and perhaps even resented at times, they were seen as beneficial and valued for their ability to answer questions others could not, and to help others. For example Mr J said of Daryl "Classmates see him as quite beneficial, but also as a threat"; Mr J of Lewis "quite valuable - they often say 'Ask Lewis' when they are stuck"; Mr L of Samantha "Others see her as quite beneficial and valuable. She gives help to others a lot"; Mrs H of

Tim P "Students are always pleased to have him as part of their project group". For Martine and Angela the benefit was reported to be restricted to their immediate neighbours. Mr L said of Martine "Kids that sit with her find her quite beneficial because she can answer the questions"; Mr B described Angela as valuable "within her group of three...Her immediate friends find her very beneficial".

In general then, the students in the study reported that they perceived their peers as viewing school as reasonably important and valuable, and felt themselves to be positively valued in the classroom, although many felt somewhat constrained to curtail their contributions. Most often the teachers' observations confirmed the students' views, and stressed the connection between the value placed on particular students, and their ability to help. There were however significant differences in this area between subgroups in the study, which are discussed in the following chapter.

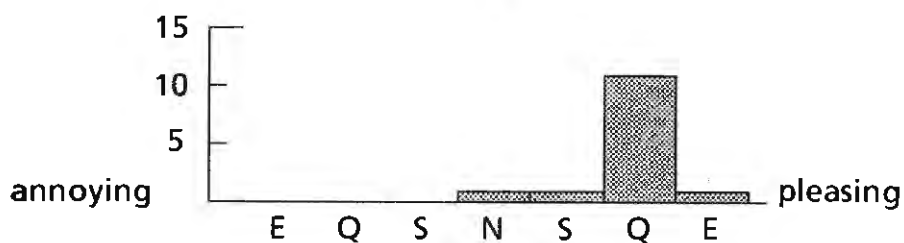
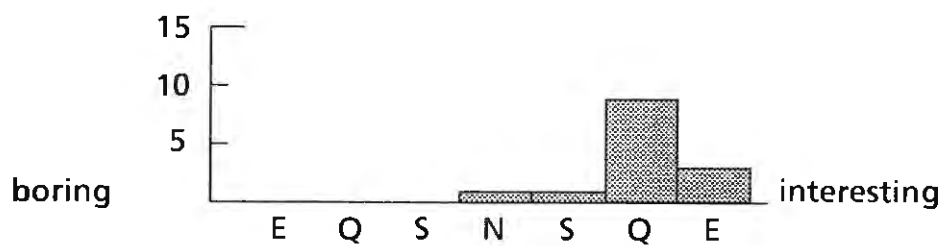
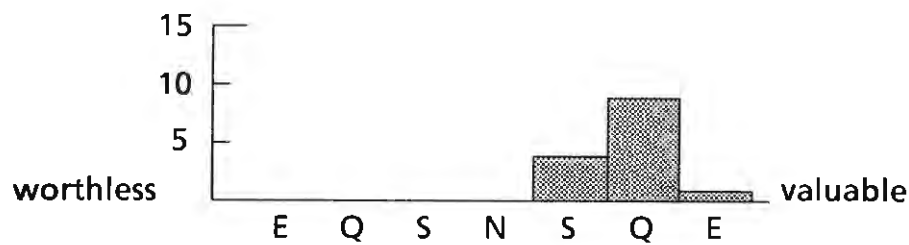
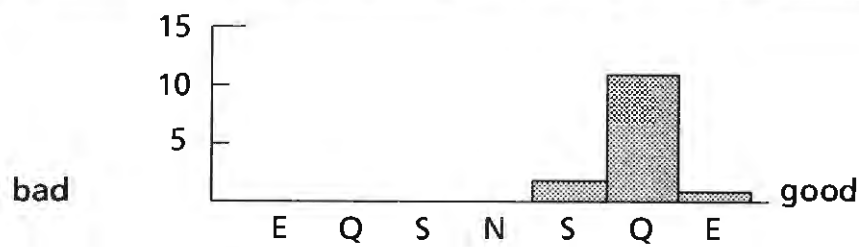
4.6.2. Perceived Teacher Response.

In answering the corresponding question (Question 5) about teachers' evaluation of their contributions, students gave much more positive responses. Not only, in their estimation, did teachers rate their contributions to be better and more valuable than the rating of their peers, but also unlike their peers, equally interesting and pleasing (Figure 8). The students often explained that they gleaned this information from teachers comments, eg. "They say things like 'Very good' or 'Interesting' (Kathy), "They

FIGURE 8. Responses To Question 5, Student Questionnaire.

Teachers consider my contributions in class to be -

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
bad	0	0	0	0	2	11	1	good	83
worthless	0	0	0	0	4	9	1	valuable	81
boring	0	0	0	1	1	9	3	interesting	84
annoying	0	0	0	1	1	11	1	pleasing	82



say nice things" (Martine). Two of the students also mentioned that at times the teacher found them to be slightly annoying, when they were talking too much (Daryl), or when their contributions were smart and "stirring" (Tim W).

Teachers' responses to the corresponding question (Question 2) in their questionnaire, were also positive and closely aligned with the students' perceptions of their opinions, including the insights of Tim and Daryl. As discussed in the preceding section, many teachers commented, however, that the students did not in fact contribute very much. Possible explanations for this may be gleaned from the elaborations of Angela and Samantha. Angela commented that while teachers considered her contributions in a positive light "they aren't ecstatic about it". Samantha, who gave the lowest estimate of teachers' opinions, explained "They don't say anything unless I get a bad mark, then say 'You could have done better!'". Though Samantha claimed that she did not "really care" about the lack of praise, her comment does raise the issue of whether bright and socially compliant students receive enough feedback, especially in the light of the paucity of teacher initiated interaction. While students often explained their reluctance to contribute in class in terms of lack of peer acceptance, it is also possible that they did not receive enough rewards from teachers to make taking the risk of speaking up worthwhile. This possibility was not directly addressed in the structured interviews held with these students, but is worthy of future research.

4.7.COPING STRATEGIES.

4.7.1.Secondary Deviance.

As discussed in Section 4.6.1. above, many students were aware that to some extent their abilities set them apart from the rest of the group. However there were no examples of this separateness leading to secondary deviance, in the form of disruptiveness, or demeaning of other students' abilities. The reactions of four students, however, could be classified under the 'secondary deviance' heading.

The first of these was Lewis who according to his teacher Mr J "enjoys his bookworm image". Certainly Lewis volunteered the information to the observer that he was an avid reader and had bought 30 books at the fete a few days previously. Additionally, Lewis was aware of his propensity to lose or forget books or equipment, a habit which along with his poor handwriting and late assignments caused much chagrin to his teachers. The "absent-minded little professor" image thus produced could be construed as passive resistance to the demands of the system.

Other students, Angela, Jamie and to a lesser degree Katie, demonstrated secondary deviance by their extreme quietness and reluctance to participate. All three mentioned that they believed that the rest of the class "did not care" about what they had to say. None experienced teacher interaction in the lessons observed, except for an occasion when Jamie was asked a question when he was looking out the window. These students seemed to have "given up" on finding school stimulating and

chose instead to withdraw as far as possible. Jamie in particular placed no value on the time spent at school at all and would have preferred to be "doing almost anything else".

4.7.2. Denial Of Ability And Other Strategies To Lessen Apparent Deviance From The Norm.

More common than secondary deviance were suggestions that the students tried to play down their abilities. Some of the students alluded to these coping strategies themselves. Samantha and Bronwyn, for example, as discussed earlier, consciously made few comments in class so as not to be resented by their classmates. For other students a similar strategy was reported by their teachers. Mr P noted of Ben that he was inclined to come at the end of a lesson with answers, rather than in class. Mr J noted that Daryl was more one of the group than Lewis, and sought the approval of his peers more. As a result he did not want to stand out and perhaps be resented, and consequently contributed less than he was able. Fiona's teacher felt that she tried "to be conservative and hide her light". Similarly Mr W reported that Tim P would not stand out in a group but would come later to discuss ideas. In the group his contributions were not necessarily superior, while on his own they were. Additionally Mr W suspected that Tim P occasionally got things wrong on purpose, and had noticed that he seemed to quite consciously adopt the latest fashion such as wearing jumpers tied around the waist. Tim P was in fact one of the more satisfied students in terms of his school experience and acceptance by peers, so that it seemed his strategies were successful.

A different approach was taken by Tim W and Martine. These students both contributed quite often in class, but were also seen to be 'stirrers' or cheeky. As a result they could be viewed and respected as part of the group, and accordingly were comfortable in their roles.

The remaining student, Kathy, is difficult to categorise. She was reported by teachers as being largely unconcerned about school work, a view confirmed by her mother. In fact she was included in the study solely on the basis of TOLA results, which had surprised her teacher, since she had never shone in the classroom. As such she was probably not perceived as deviant by her peer group, and certainly did not report that she felt deviant. Thus no coping strategies were necessary.

In summary then, 9 of the 14 students could be seen to have adopted strategies which lessened the distance between themselves and the norm, either by lower performance or social behaviour. Four of the remaining students demonstrated secondary deviance with 3 of the 4 demonstrating withdrawal from involvement.

CHAPTER 5. RESULTS REVEALING DIFFERENCES BETWEEN SUBGROUPS.

While the preceding chapter dealt with results for the group as a whole this chapter discusses results revealing differences between subgroups. Three areas are discussed in turn, (i) sex differences, (ii) primary and high school differences, (iii) differences between those who demonstrate superior scores on tests associated with simultaneous processing, and those who demonstrate superior results on tests associated with successive processing.

5.1. SEX DIFFERENCES.

5.1.1. WISC-R Results.

Examination of Table 2 (p. 41) reveals several sex differences in WISC-R scores. While the range of full scale scores was similar for boys and girls (126-144 for boys and 120-141 for girls), the median score for boys (137) was considerably higher than the median score for girls (128). Application of the Mann-Whitney *U* Test shows the boys' full scale scores to be significantly higher than those of the girls ($p = .036$). However for many individual subtests there were no significant differences in scores and on several subtests girls' median scores exceeded those of the boys. These latter tests, were Similarities, Arithmetic, Comprehension, Digit Span, and Block Design. Four of these are verbal subtests, two of which (Similarities and Comprehension) have been associated with successive processing (Cummins and Das, 1980), while Digit Span has generally been regarded as a marker test for successive processing (eg. Das, Kirby and Jarman, 1979). These results are in

contrast to Karnes and Brown's (1980) findings that gifted boys' mean scores exceed those of girls on these subtests. Karnes and Brown's sample was drawn from a pool of students whose IQ scores had already been measured as exceeding 120. It seems then that when teachers are asked to nominate gifted students they may be more likely to choose students who perform well on successive tasks, and that this tendency may be even greater for girls. A comment from Mr J while discussing Fiona and her maturity is indicative of this tendency. "I really think that a lot has to do with expectations. Once a child conforms to what teachers want - they're neat, they're on time, they try hard, they say all the right things in class - teachers label them as being bright". One can speculate then that girls are more likely to be labelled as bright if they do well on successive processing tasks, are quiet, polite and undemanding. This need for social compliance could explain the particularly high median and mean scores (both 16) for the girls in the study on the Comprehension subtest. Both were higher than those for boys (15 and 15.7 respectively), despite the boys' significantly higher full scale scores.

5.1.2. Teachers' Reactions.

As discussed in the previous chapter, students had little interaction with teachers in class, and instances of teacher initiated interaction were very few. As Table 5 indicates, there were in addition clear differences between boys and girls in this area. Among the girls there was only one recorded instance of the teacher initiating interaction, other than asking for answers, in response to answers being volunteered. This one occasion occurred when the teacher checked the progress of a student who was working on a programmed Mathematics course. In response

to volunteered answers, there are 3 recordings of requests for answers, from 14 offers. The boys fared considerably better with 11 recordings of interaction initiated by the teacher, although 2 of these were simply routine homework checks. The boys were asked for a volunteered answer on 2 occasions out of 17 offers. The discrepancy between the sexes in the amount of interaction is consistent with that reported by Spender (1980, 1982).

The teachers' reactions to students' contributions were also more enthusiastic for boys. As Figures 9a and 9b indicate, teachers ranked boys' responses more positively than girls'. This difference is significant at the .025 level (Mann-Whitney *U* test). Since the boys in the study had higher full scale scores on the WISC-R, it is possible that their contributions were superior, or it may be that teachers' perceptions simply reflect the tendency for teachers to view boys' contributions as being more significant and to believe that boys have superior potential (Spender, *op cit*). The teachers' perceptions of classmates' reactions also showed a more positive rating for boys (Figures 10a and 10b), although the difference is not statistically significant. Whether this reflected the teachers' bias or was an accurate assessment of the bias of the class is not clear. The students themselves perceived classmates' reactions in approximately equal terms (Figures 11a and 11b), and, reversing the trend for teachers, girls experienced more student initiated interaction than boys (girls 29, boys 13, Table 7). The girls were both involved in more conversation, and asked to help more often, which suggests that their ideas may in fact be more highly valued than boys. To investigate these differences in teachers' perceptions further, it would be necessary to compare teacher reactions to male and female students of the same measured IQ, and to measure directly the reaction of classmates.

FIGURE 9a. Comparison Of Teachers' Reactions To Boys' And Girls' Contributions.

Responses To Question 2, Teacher Questionnaire.

His/Her contributions in class are -

(a) Boys (n = 12)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
worthless	0	0	0	1	1	5	5	valuable	74
stereotyped	0	0	0	0	1	4	7	original	78
annoying	0	0	0	0	2	5	5	pleasing	75
inferior	0	0	0	0	2	5	5	superior	75

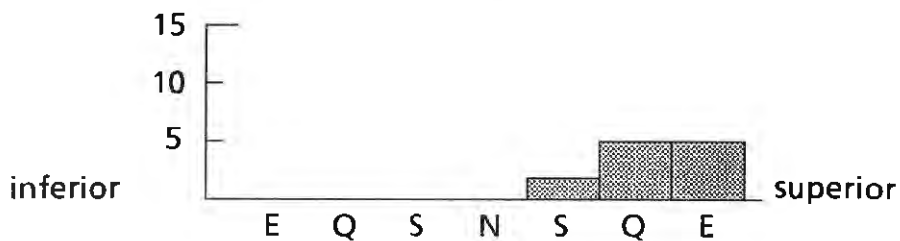
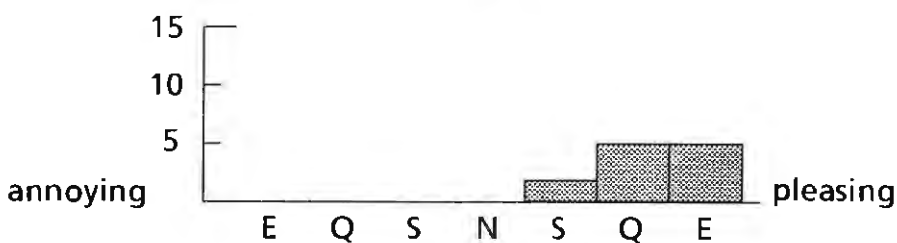
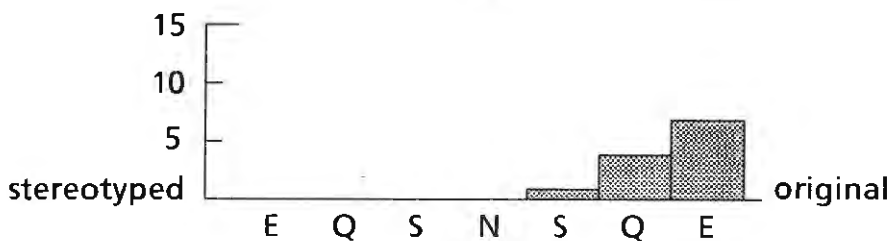
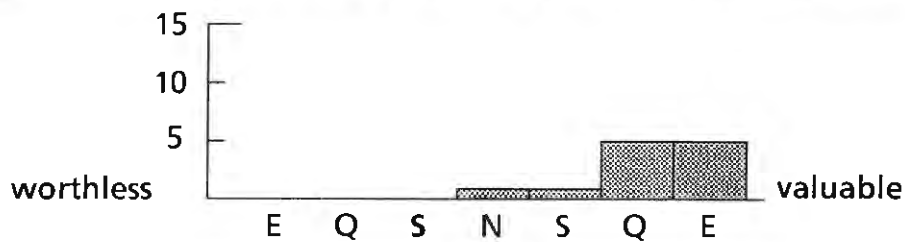


FIGURE 9b. Comparison Of Teachers' Reactions To Boys' And Girls' Contributions

Responses To Question 2, Teacher Questionnaire.

His/Her contributions in class are -

(b) Girls (n = 13)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
worthless	0	0	0	4	3	5	1	valuable	68
stereotyped	0	0	0	3	4	4	2	original	70
annoying	0	0	0	2	1	6	4	pleasing	77
inferior	0	0	0	2	2	8	1	superior	73

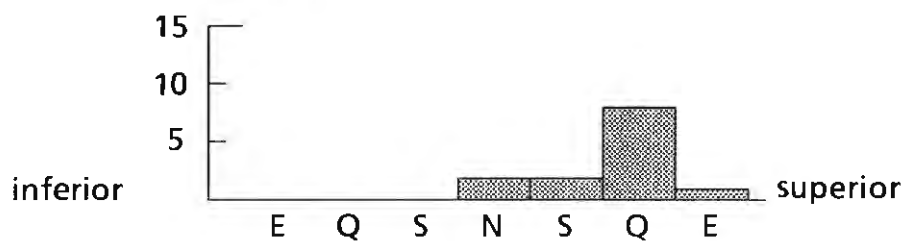
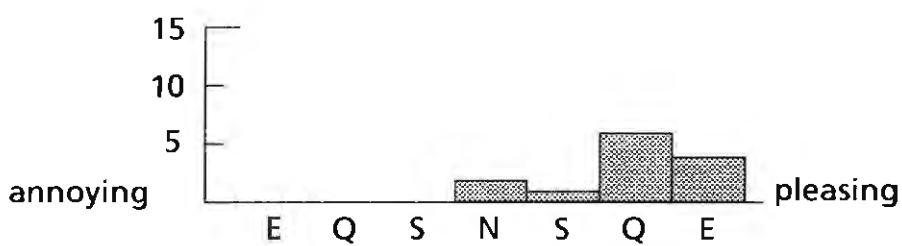
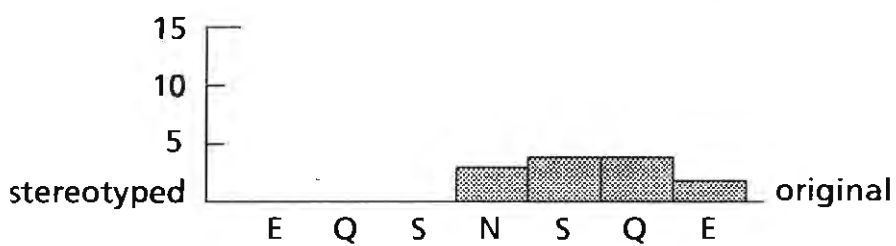
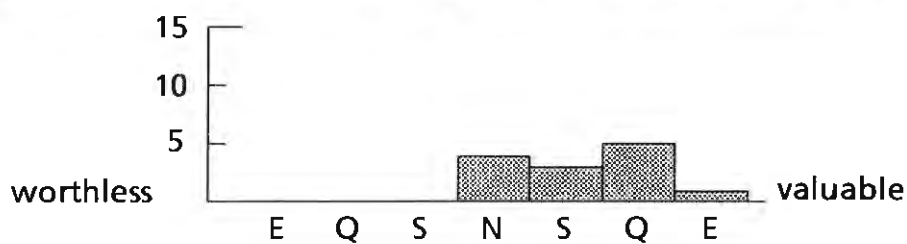


FIGURE 10a. Comparison Of Teachers' Perception Of Class Reaction To Boys And Girls.

Responses To Question 3, Teacher Questionnaire.

Classmates consider his/her presence in class to be -

(a) Boys (n = 12)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
harmful	0	0	0	2	2	6	2	beneficial	68
annoying	0	0	2	2	2	4	2	pleasing	64
worthless	0	0	0	2	2	7	1	valuable	67

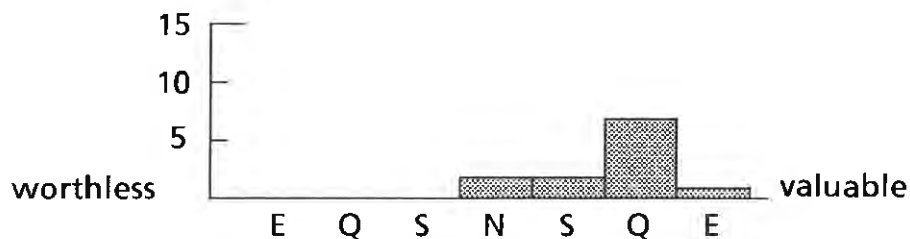
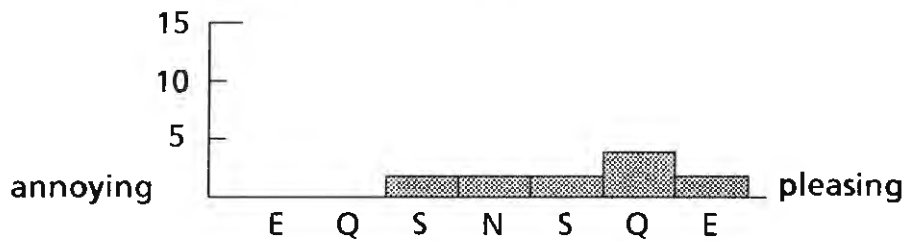
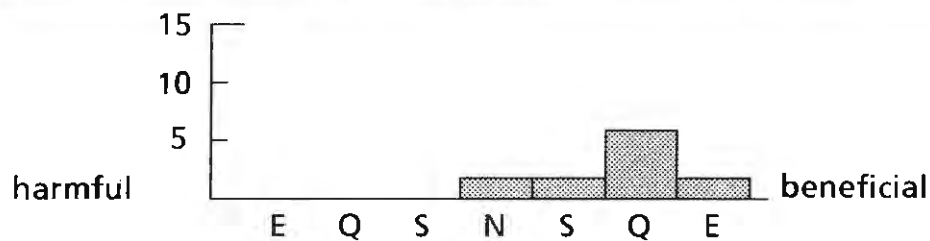


FIGURE 10b. Comparison Of Teachers' Perception Of Class Reaction To Boys And Girls.

Responses To Question 3, Teacher Questionnaire.

Classmates consider his/her presence in class to be -

(b) Girls (n = 13)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
harmful	0	0	0	5	2	5	1	beneficial	67
annoying	0	0	0	8	1	4	0	pleasing	61
worthless	0	0	0	4	2	6	1	valuable	69

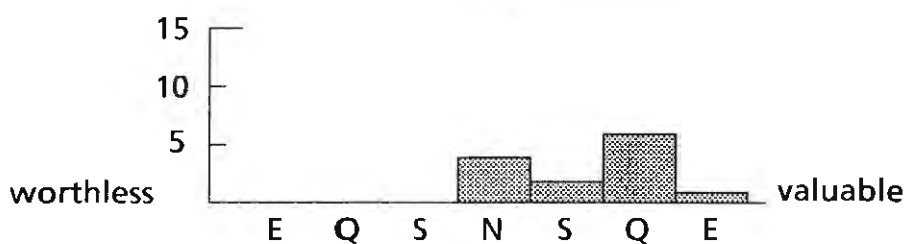
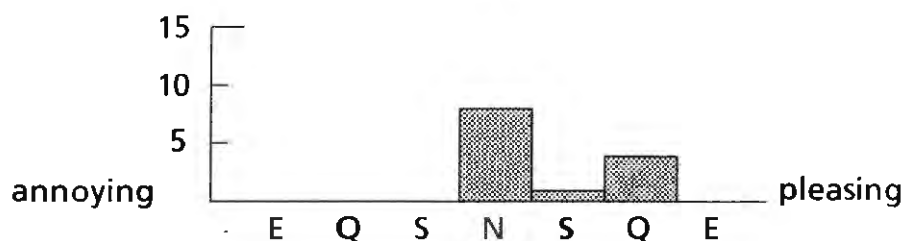
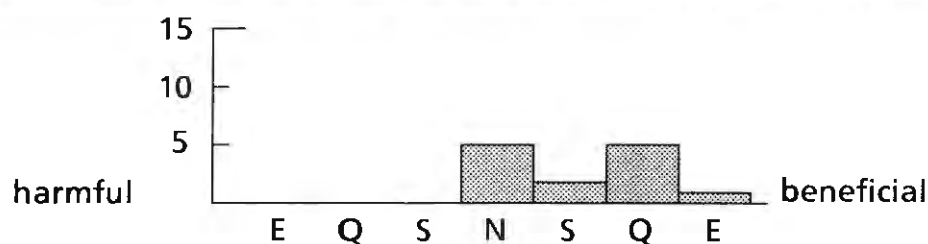


FIGURE 11a. Comparison Of Boys' And Girls' Perceptions Of Peer Reactions.

Responses To Question 4, Student Questionnaire.

Classmates consider my contributions in class to be -

(a) Boys (n = 7)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
bad	0	0	0	3	0	4	0	good	34
worthless	0	0	0	2	2	2	1	valuable	37
boring	0	0	2	2	2	1	0	interesting	30
annoying	0	0	0	3	4	0	0	pleasing	32

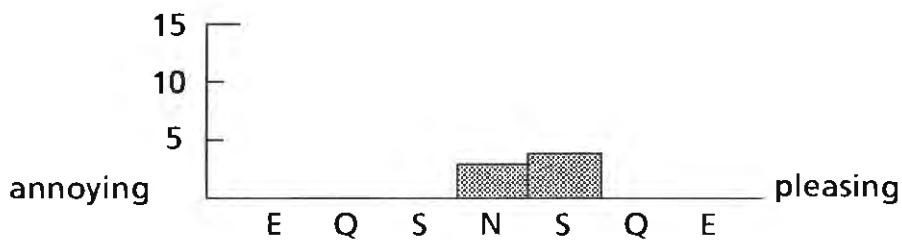
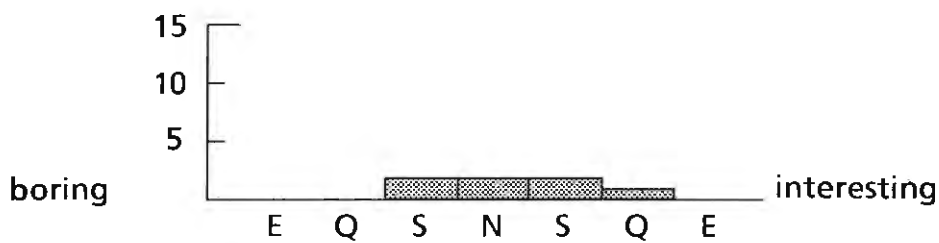
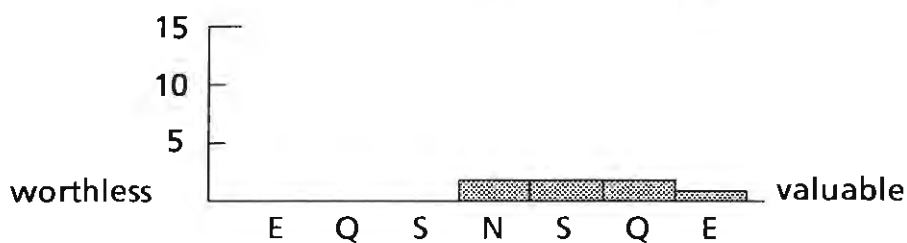
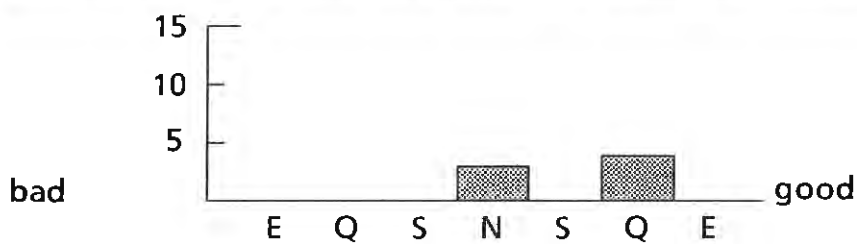


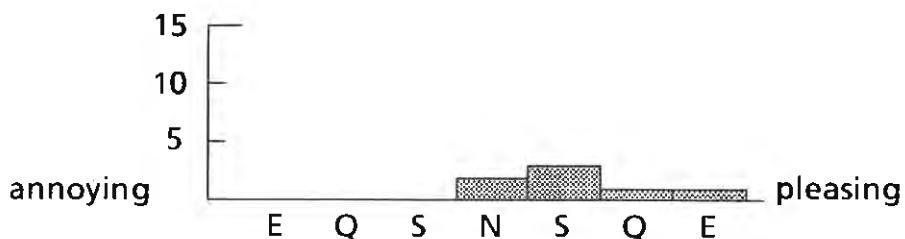
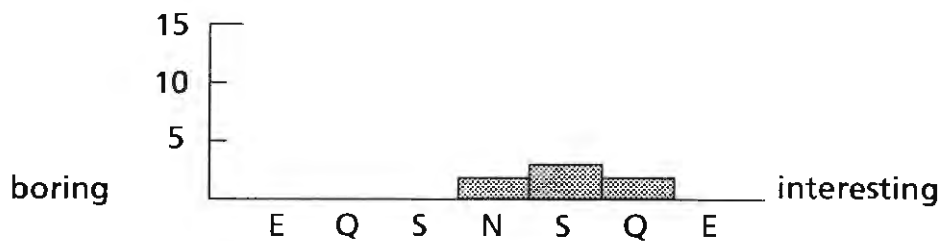
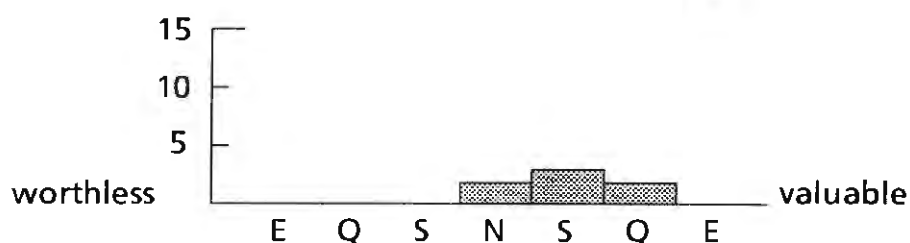
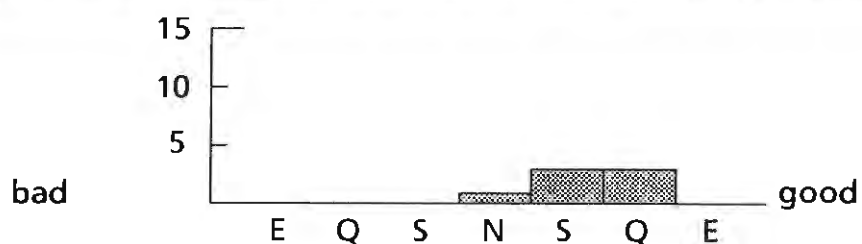
FIGURE 11b. Comparison Of Boys' And Girls' Perceptions Of Peer Reactions.

Responses To Question 4, Student Questionnaire.

Classmates consider my contributions in class to be -

(b) Girls (n = 7)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
bad	0	0	0	1	3	3	0	good	37
worthless	0	0	0	2	3	2	0	valuable	35
boring	0	0	0	2	3	2	0	interesting	35
annoying	0	0	0	2	3	1	1	pleasing	36



5.2.PRIMARY / HIGH SCHOOL DIFFERENCES.

Two instances arose of differences between primary and high school experiences. While neither is statistically significant, they do indicate an increasing isolation from peers, and a less satisfactory relationship with teachers, as students made the transition from primary to high school. The first difference was in students' perceptions of peer responses (Figures 12a and 12b). Primary students felt their contributions to be slightly more positively received by peers than did high school students. This difference possibly explains the more frequent conscious decision of high school students not to stand out in class so as not to attract attention for being different.

The second area of difference was in the personal security of teachers. As Figures 13a and 13b indicate, primary teachers were slightly more at ease in their dealings with students than high school teachers. The difference is at least partly explicable in terms of the extra time that primary teachers spent with the students and the increased range of activities they shared with them. Primary teachers knew more of the individual strengths and weaknesses of the students they worked with. High school teachers had less personal involvement, reflected, for example, in the fact that only two high school teachers could answer the question of parental feelings, as the others simply had not met the students' parents. In contrast, all primary teachers had had contact with parents. Primary teachers also appeared to find it easier and more rewarding to cater for these students (Figures 14a and 14b), although there were no differences in the reported attitude of colleagues and superiors towards programming for them.

FIGURE 12a. Comparison Of Primary And High School Students' Perceptions Of Peer Reactions.

Responses To Question 4, Student Questionnaire.
Classmates consider my contributions in class to be -
(a) Primary (n = 8)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
bad	0	0	0	3	0	5	0	good	42
worthless	0	0	0	2	2	3	1	valuable	43
boring	0	0	1	2	2	3	0	interesting	39
annoying	0	0	0	3	3	1	1	pleasing	40

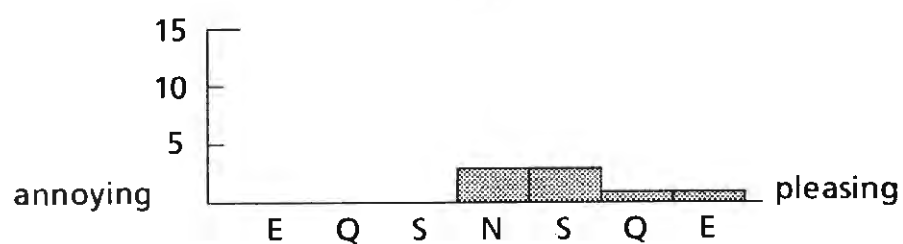
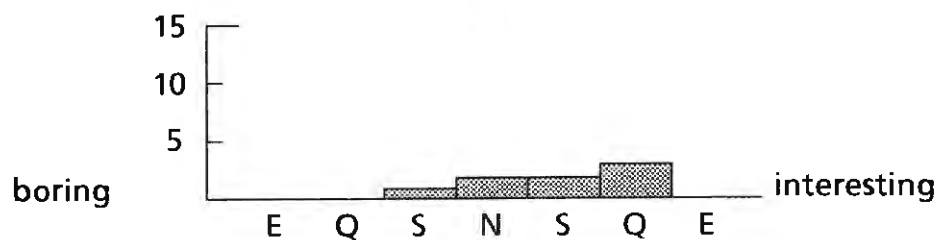
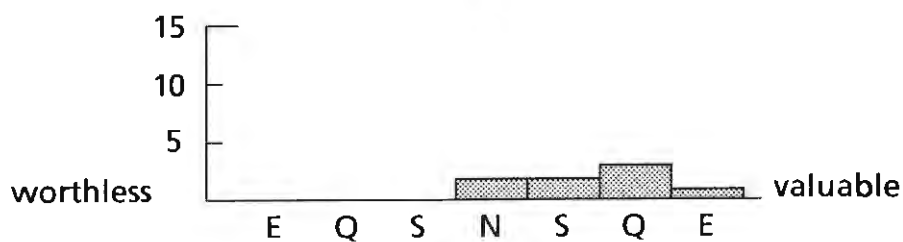
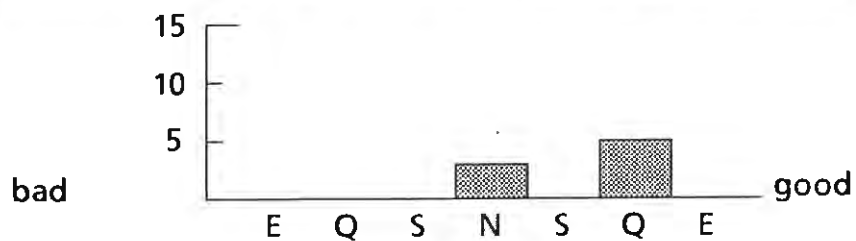


FIGURE 12b. Comparison Of Primary And High School Students' Perceptions Of Peer Reactions.

Responses To Question 4, Student Questionnaire.

Classmates consider my contributions in class to be -

(b) High (n = 6)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
bad	0	0	0	1	3	2	0	good	31
worthless	0	0	0	2	3	1	0	valuable	29
boring	0	0	1	2	3	0	0	interesting	26
annoying	0	0	0	2	4	0	0	pleasing	28

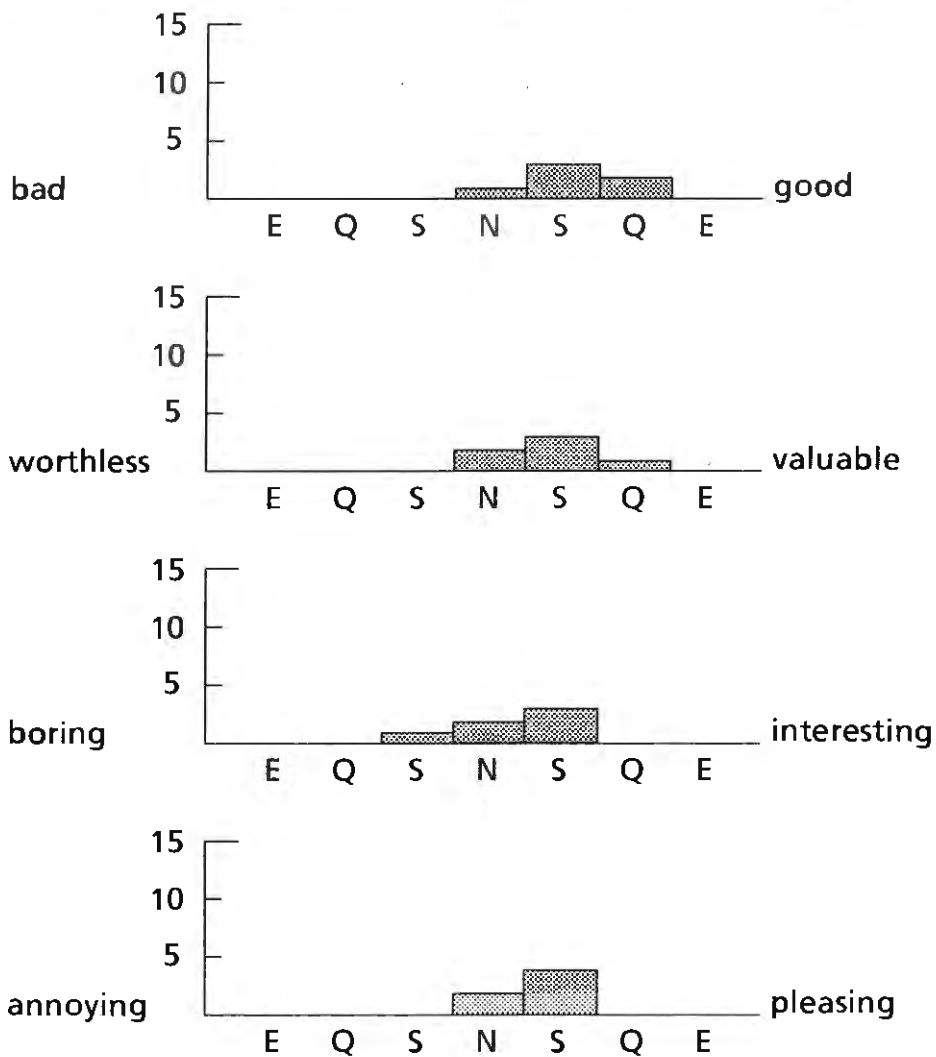


FIGURE 13a. Comparison Of Primary And High School Teachers' Reactions.

Responses To Question 4, Teacher Questionnaire.

Having him/her in my class leaves me feeling -

(a) Primary (n = 14)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
weak	0	0	0	8	0	4	2	strong	70
tense	0	0	0	3	1	3	7	relaxed	84
uneasy	0	0	0	2	1	5	6	comfortable	85

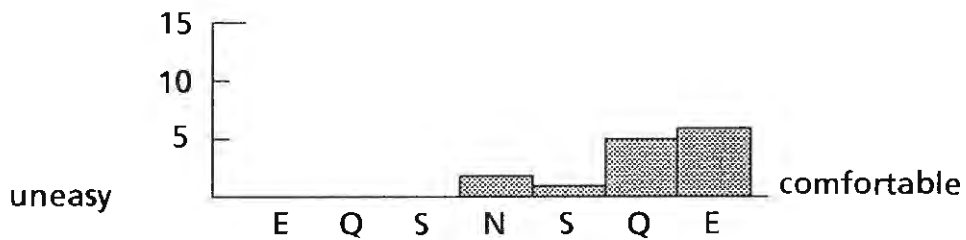
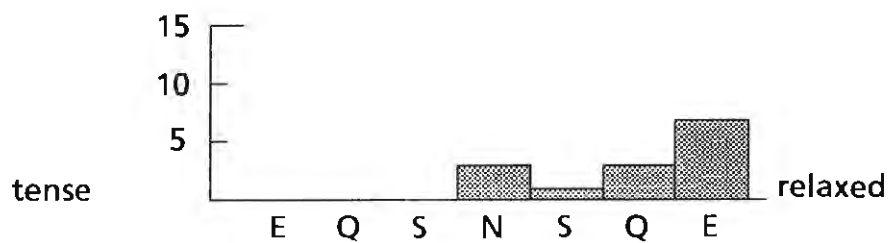
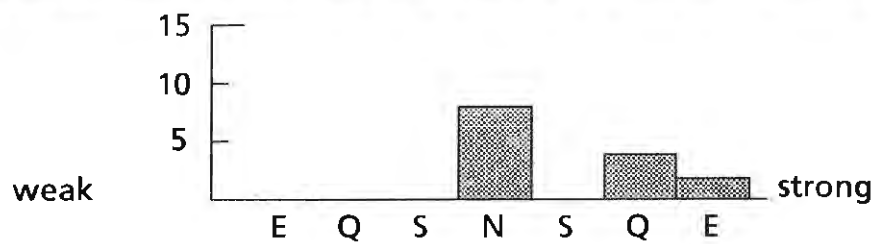


FIGURE 13b. Comparison Of Primary And High School Teachers' Reactions.

Responses To Question 4, Teacher Questionnaire.

Having him/her in my class leaves me feeling -

(b) High (n = 11)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
weak	0	0	0	7	1	3	0	strong	51
tense	0	0	1	2	1	6	1	relaxed	59
uneasy	0	0	1	2	1	6	1	comfortable	59

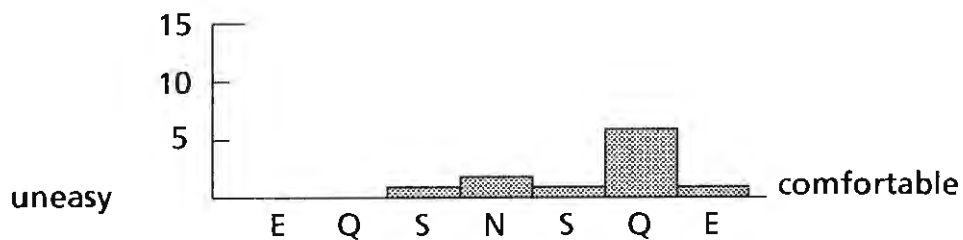
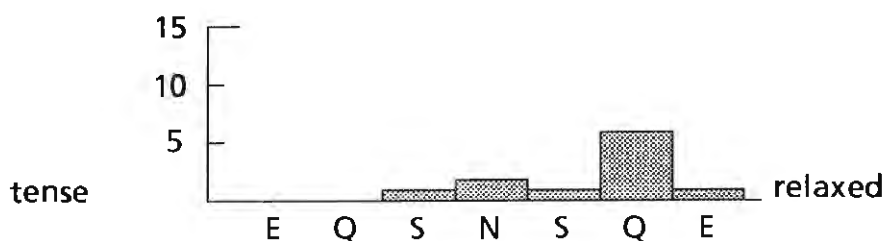
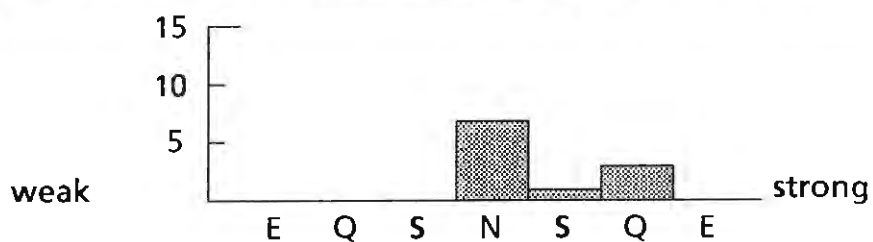


FIGURE 14a. Comparison Of Primary And High School Teachers' Reactions.

Responses To Question 1, Teacher Questionnaire.

To cater for him/her in my class is -

(a) Primary (n = 14)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
difficult	0	2	3	2	0	1	6	easy	69
punishing	0	0	0	1	2	4	7	rewarding	87
routine	0	0	0	2	2	7	3	challenging	81

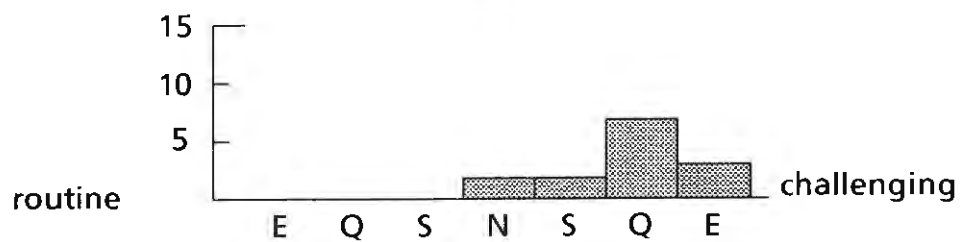
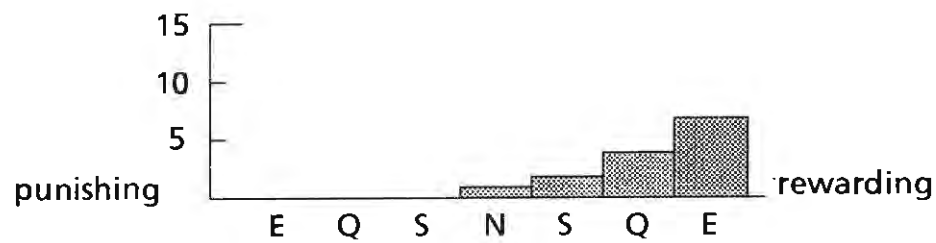
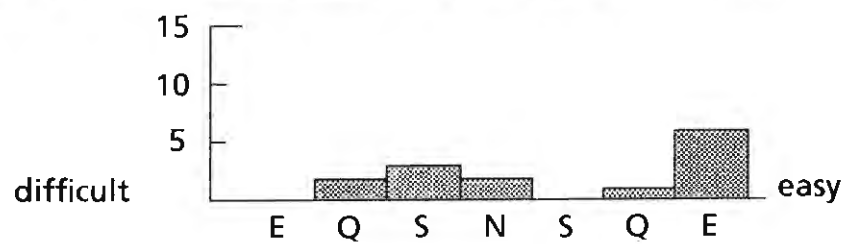


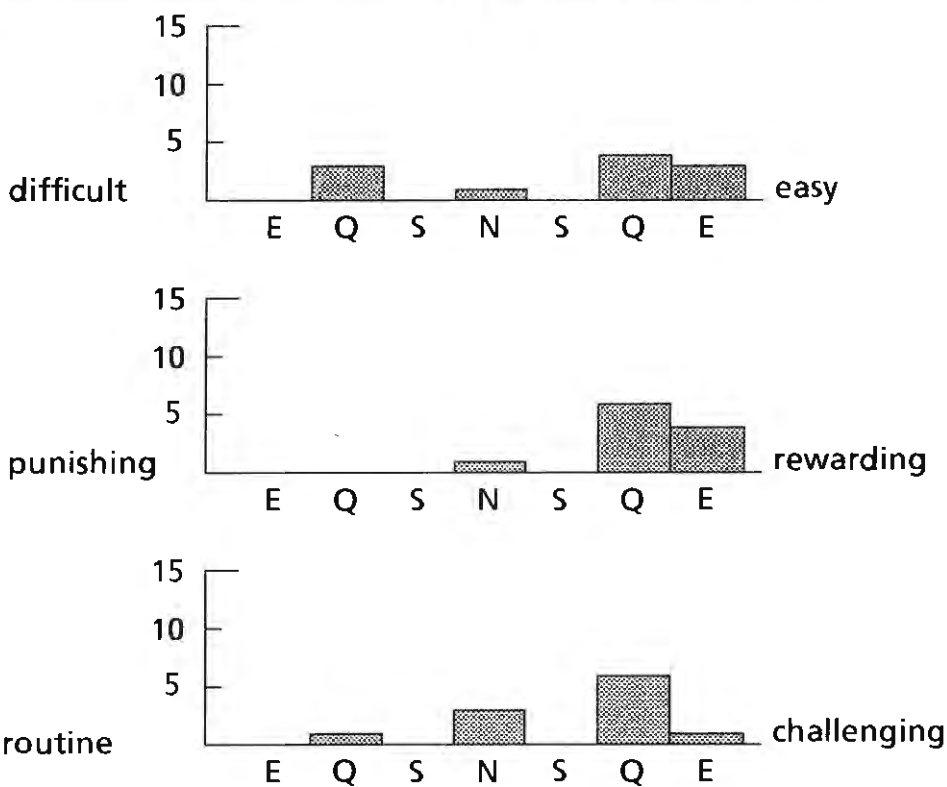
FIGURE 14b. Comparison Of Primary And High School Teachers' Reactions.

Responses To Question 1, Teacher Questionnaire.

To cater for him/her in my class is -

(b) High (n = 11)

	E (1)	Q (2)	S (3)	N (4)	S (5)	Q (6)	E (7)		TOTAL (Scoring 1-7)
difficult	0	3	0	1	0	4	3	easy	55
punishing	0	0	0	1	0	6	4	rewarding	68
routine	0	1	0	3	0	6	1	challenging	57



5.3.DIFFERENCES BETWEEN STUDENTS WHO ACHIEVE SUPERIOR RESULTS ON SUBTESTS ASSOCIATED WITH SIMULTANEOUS PROCESSING, AND THOSE WHO ACHIEVE SUPERIOR RESULTS ON SUBTESTS ASSOCIATED WITH SUCCESSIVE PROCESSING.

To explore the differences, if any, between students who demonstrated superior performance on tasks associated with simultaneous processing, and those who performed better on 'successive' tasks, two groups were formed by ranking students in order of difference as shown in Table 4 (p. 45) and considering in particular those at each end of the new table (Table 8). The three students with the lowest rankings (ie. Ben, Jamie and Bronwyn) were compared with the three students with the highest rankings (ie. Samantha, Lewis and Kathy). For ease of description the former group will be referred to as 'simultaneous' processors while the latter group will be termed 'successive' processors. As for the terms 'successive' subtests and 'simultaneous' subtests, employed in the preceding chapter, these shorthand names are not intended to suggest that a direct measure of such processing has been obtained, or that the students so named employ this mode of processing exclusively.

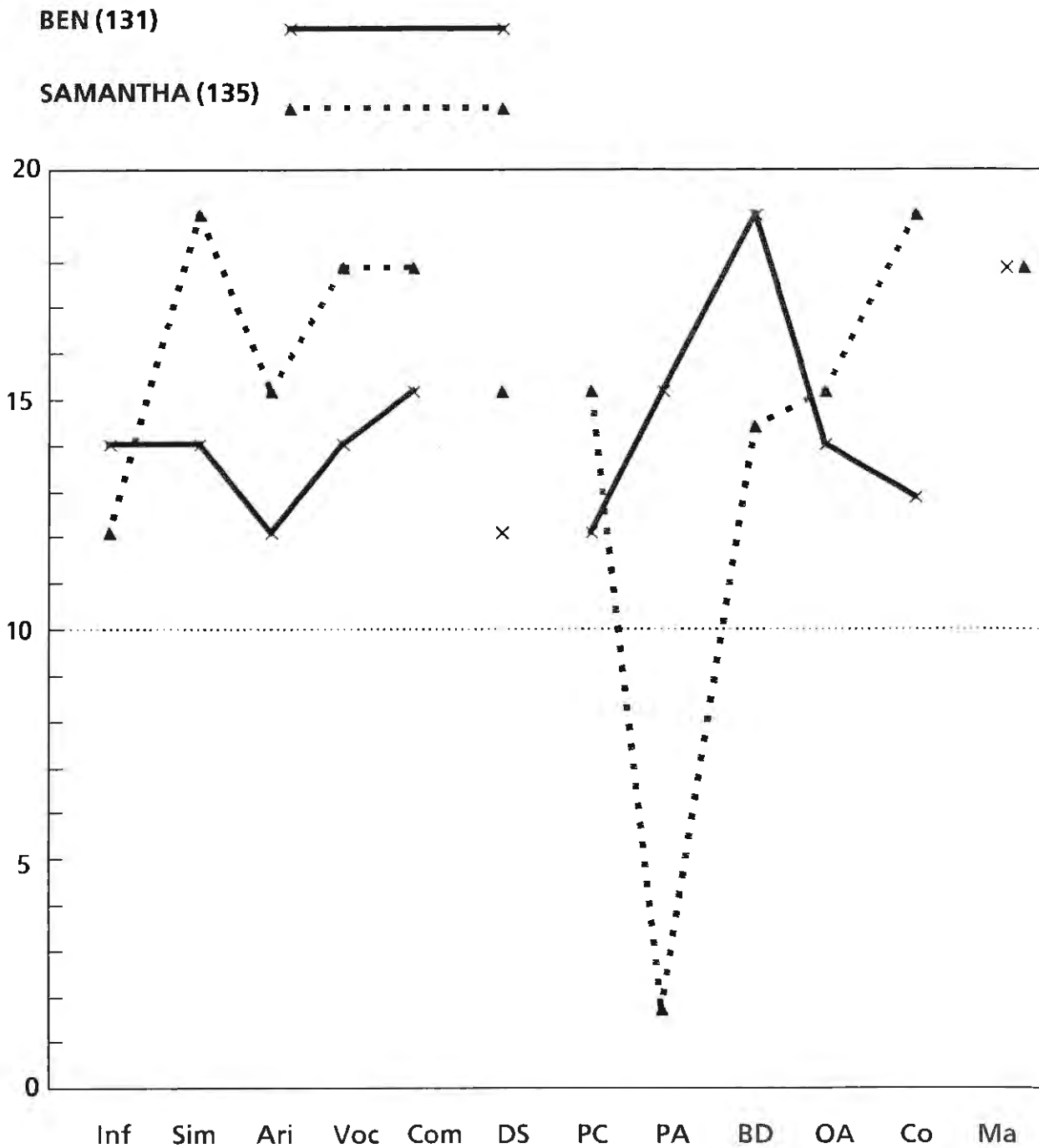
5.3.1.WISC-R Results.

An illustration of the differences in strengths and weaknesses between the two groups may be seen in Figure 15 - a comparison of profiles for 2 students with the similar full scale IQ, but one a 'simultaneous' and one a 'successive' processor. It must be noted that the extremely low score for Samantha on Picture Arrangement was not included in the 'simultaneous' scores used

TABLE 8. Students Listed in Rank Order of Difference Revealed in Table 4.

Student	Difference
Samantha	+ 8
Lewis	+ 7
Kathy	+ 6
Daryl	+ 5
Tim W.	+ 4
Tim P.	+ 2
Katie	+ 1
Fiona	+ 1
Martine	0
Angela	-2
Chris	-2
Bronwyn	-4
Jamie	-5
Ben	-5

FIGURE 15. Comparison Of WISC-R Profiles For Students With Similar Full Scale Scores.



Inf Information
 Sim Similarities
 Ari Arithmetic
 Voc Vocabulary
 Com Comprehension
 DS Digit Span

PC Picture Completion
 PA Picture Arrangement
 BD Blockdesign
 OA Object Assembly
 Co Coding
 Ma Mazes

to generate the groups. Clearly the similar full scale scores do not indicate similar cognitive styles.

Perusal of Table 2 (p. 41) reveals an outstanding difference between the scores of the 'simultaneous' and 'successive' processors. The former, Bronwyn, Ben and Jamie, all had scores below the median (16) for Comprehension (14,14,13) while the second group, Samantha, Lewis and Kathy, all scored above the median (18,18,18). The difference is significant on application of the Mann-Whitney *U* Test ($p < .05$). This is particularly noteworthy, given that Bronwyn and Jamie had full scale scores above the median, while Kathy's full scale score was below the median. It may indicate that those who show an aptitude for simultaneous processing are less likely to demonstrate social compliance than those who show an aptitude for successive processing. This is in line with Crawford's findings (1985, Personal Communication) that teachers rank the social compliance of students in accordance with demonstrated successive ability. Given that for the group as a whole, Comprehension had the highest median, one can speculate that 'simultaneous' processors are less likely to be considered gifted by teachers. For 2 of the 3 students in the 'simultaneous' processing group (Bronwyn and Jamie) the 'successive' total on Similarities and Vocabulary was at or above the median for the whole group while Ben's score was just below. This suggests that for these students, demonstrated successive ability may be high enough to enable them to be seen as gifted, despite lower social comprehension. It leads to speculation, however, that students of high simultaneous processing ability who do not score so highly on successive tasks

may be overlooked in teacher identification, and that this is particularly so for girls.

5.3.2. Response To Classroom Instruction And Methods.

Two of the three 'simultaneous' processors, Ben and Jamie, expressed less satisfaction than any of the rest of the students with school as a whole. Both felt that they "got nothing out of it". Bronwyn gave more positive responses but her expressed satisfaction dealt with long term gain and not with immediate educational experience.

In the more specific area of school tasks and assignments, the 'simultaneous' processors were significantly less satisfied than the 'successive' group ($p < .05$, Mann-Whitney *U* Test). All three expressed the view that assignments were boring and routine. As a group they also accounted for 5 of the 9 "not on task" recordings which indicated boredom (Table 5, p. 52). The classroom experience for these students was clearly not meeting their needs.

These results confirm the hypothesis outlined in Research Question 4 (p. 22) that children who demonstrate a high level of simultaneous processing would feel particularly bored and frustrated in a classroom oriented to the use of successive processing skills. While students such as Ben and Jamie have reacted by withdrawing and enduring the school experience, it is possible, if not probable, that other 'simultaneous' processors, of high academic potential and ability, have given vent to their dissatisfaction by uncooperative and disruptive behaviour. As

long as the emphasis in identification remains on socially compliant students with demonstrated successive processing ability, such students are likely to remain unrecognised.

5.3.3. Teachers' Reactions.

The three simultaneous students did not differ significantly from the successive group in their effect on teachers. The teachers of all three reported that they made very few contributions in class, which was confirmed in classroom observation, and on the whole teachers felt relaxed and comfortable.

5.3.4. Social Experience In The Classroom.

Several differences were apparent between the groups in the area of peer values. First, 'simultaneous' students perceived peers to ascribe lesser importance and value to school than the 'successive' group. This difference was significant as measured on the Mann-Whitney *U* Test ($p < .05$). Of the three, Jamie was by far the most negative, believing that his classmates found school to be quite unimportant and quite worthless.

In reporting on peers' reception of their contribution in class, the three 'simultaneous' processors gave the lowest ratings of the group. When students were ranked in order of the numerical total of their answers on Question 4, the 'simultaneous' processors shared the lowest score with Chris, who also had a higher 'simultaneous' than 'successive' score (Table 9). Again the difference in scores between this group and the 'successive' processors was significant ($p < .05$, Mann-Whitney *U* Test).

TABLE 9. Numerical Totals For Responses To Question 4, Student Questionnaire.

Student	Total Score (Maximum Possible 28)
Fiona	25
Kathy	24
Lewis	23
Martine	22
Tim W.	22
Daryl	21
Tim P.	21
Samantha	19
Angela	19
Katie	18
Chris	16
Ben	16
Bronwyn	16
Jamie	16

The perceived peer response may explain the low frequency of contributions from these students, reported in Section 5.3 above. All three students alluded to the negative reactions of classmates, as they elaborated on their questionnaire responses. Jamie reported quite flatly that his contributions had no effect either way on his classmates - "they are no more interesting or valuable than anyone else's". Ben discussed classmates' reactions more in terms of their view of himself stating that "most of the boys seem to be rival (sic) to schoolwork. They don't seem to really like me. The girls are OK". Bronwyn combined both points of view in her responses. In marking "slightly good" she commented that "sometimes they say 'she's a square!'". She chose "neither" for the dimensions valuable/worthless and interesting/boring noting that "most don't listen, unless you're talking directly to them". In choosing "slightly annoying" for the last dimension, Bronwyn explained that "if you get better marks than them, they don't want to listen".

For each of these three students, the teachers' perceptions of classmates' reaction were more positive. Jamie's teacher felt the class considered Jamie's presence quite beneficial, quite pleasing and slightly valuable, adding that it was "good to have him as 'the smart kid'", but he was not "personally valuable to them". Ben's teachers had differing views, one believing that Ben's classmates were neutral towards him and that he was a non-entity in the classroom, while the other believed that he was considered quite a valuable member, able to answer questions that the group could not answer. This teacher added, however, that Ben was not a particularly well liked member of the class, and often approached him with "red-herrings on the way out of the

classroom - out of a need to communicate with someone". Bronwyn's English teacher agreed with Bronwyn's view that apart from the group of girls that she sat with, most of the class did "not take any notice". However, they probably considered her quite valuable and certainly did not resent her "probably because she's more withdrawn". Her mathematics teacher also noted that Bronwyn did not contribute very much to the class as a whole, but that when she did "sometimes they're interested, sometimes it's water off a duck's back". However she was extremely beneficial and quite valuable to turn to for help - "they pester her if they can't do it any other way". In general then, the teachers' view is that the students are certainly valued for their ability to help out, though not necessarily for themselves. While it is more positive than the students' own view it is closely aligned to it and confirms the students' feelings of being under-valued and isolated.

In contrast to the similarity between these students' perceptions of their classmates' reactions and the teachers' perceptions, students who felt most positively received did not have their impressions confirmed by teachers. Fiona and Kathy, who also made few contributions, each reported being well received, while teachers reported that the class had a quite neutral attitude towards their responses, and that Kathy in particular simply made no impression. Perhaps the difference is suggested by Mischel's observation that "a key to avoiding depression is to see oneself less stringently and more favourably than others see one" (1979 p. 572). The 'simultaneous' processors have a more accurate perception of others' reaction and receive less positive feedback on self. In the absence, as well, of teacher initiated interaction or sufficient reinforcement from teachers for contributions (as

discussed in Chapter 4), and given that tasks are perceived as boring and time-filling, the classroom experience for these students must be far from satisfying.

CHAPTER 6. SUMMARY OF RESULTS, KEY ISSUES AND FUTURE DIRECTIONS.

6.1.SUMMARY OF RESULTS.

6.1.1.Identification.

The primary method used by teachers was status information. All students identified scored well on WISC-R subtests associated with successive synthesis, and most displayed higher scores on these tasks than on those associated with simultaneous processing. The students for whom the reverse was true had some significantly different results from the rest of the group.(See section 6.1.4.)

6.1.2.Results For The Group As A Whole.

Students were reasonably satisfied with being at school although this satisfaction derived largely from factors extrinsic to the school experience itself. They found school tasks to be, on the whole, quite easy and not greatly challenging. All lessons observed were tightly teacher directed, with no call for higher level processes or outcomes. The students generally made few contributions in class and had little interaction with teachers. There was some indication that, though teachers reported feeling quite comfortable, they were less personally secure the more the students contributed to class. Primary teachers were more at ease than high school teachers. The students believed their contributions to be received positively by peers, but several curtailed their contributions so as not to stand out in the group. They also believed their contributions to be positively valued by

teachers, but there was some indication that they did not receive adequate positive feedback for their efforts and ability.

6.1.3. Sex Differences.

The boys in the study had significantly higher full scale WISC-R scores than the girls, but there were no significant differences for scores on subtests associated with simultaneous and successive processing. Median scores on several 'successive' subtests, and median and mean scores on Comprehension were higher for girls, leading to speculation, confirmed by some teachers' comments, that girls may be identified as gifted, more on social compliance grounds than on intellectual capacity. Gifted girls experienced considerably less teacher initiated interaction than boys, and their classroom contributions were significantly less positively valued by teachers than boys' contributions. In contrast girls experienced more student initiated interaction, and were often asked for assistance, particularly in mathematics lessons. There were no significant differences between boys and girls in the way they perceived their class contributions to be received by peers.

6.1.4. Differences For Those Who Scored Higher On Tasks Associated With Simultaneous Processing.

The students who scored higher on tasks associated with simultaneous processing had significantly lower scores on Comprehension - a test often considered to measure social knowledge and understanding. This suggests that 'simultaneous' processors who do not also have high level successive skills are unlikely to be perceived as gifted. 'Simultaneous' processors find

school tasks significantly more routine and boring than 'successive' processors. They also perceive their classmates to place a lower value on school than do 'successive' processors. Of the whole group these students perceive their contributions in class to be received by their peers least positively.

6.2.DIRECTIONS FOR FUTURE RESEARCH.

6.2.1.Replication Of Results Of This Study.

Owing to the small sample size of this study, replication of results for a larger population is desirable. Identification methods, sex differences, differences between 'simultaneous' and 'successive' processors could all be investigated for a larger group. In a larger group, indicators of cognitive style could also be obtained by use of tests which measure simultaneous and successive processing directly.

6.2.2.Questions Arising From The Study.

Some results indicated, but not specifically addressed, by this study, require clarification by future research. The first of these is the suggestion that in order to be identified as gifted, it is necessary for students to demonstrate high levels of social knowledge and behaviour, and that this is particularly so for girls. Are less socially compliant girls even more likely to be overlooked than similar boys?

Second, the suggestion by teachers that peers are more accepting of boys' class contributions, needs to be addressed by direct

reference to peer groups. Are teachers' perceptions, or the reports of the students themselves of no difference in acceptance of boys' and girls' contributions, more realistic? If the boys' contributions are accepted more readily, what factors produce this preference?

Third, it was indicated by some students that they received little positive feedback or encouragement from teachers, and certainly the level of teacher initiated interaction was low. Is the level of interaction and reinforcement lower for gifted students than for average students? If it is, what are the implications for gifted students' performance, confidence and self concept?

6.3.KEY ISSUES AND RECOMMENDATIONS.

Three key issues arise from the results. The first is the low number of 'simultaneous' processors included in the sample. The second is the low level of satisfaction among those who are included. Third is the predicament of gifted girls, who receive less attention, and for whom simultaneous processing skills may be even more overlooked than for boys. Since the field study employed a case study approach with a very small sample, these results need to be replicated and expanded before being viewed as representing general trends. Some recommendations may however still be made.

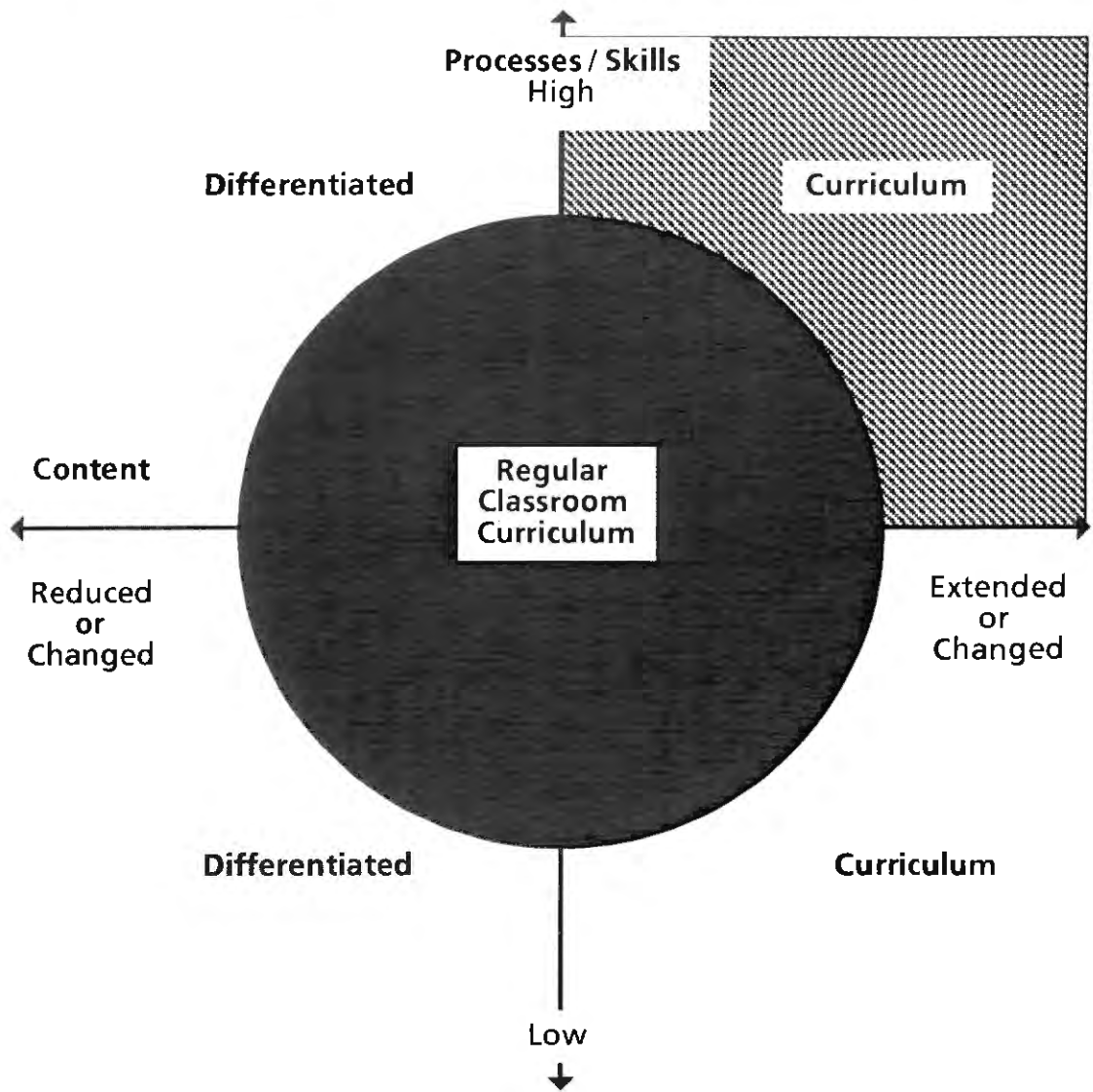
First, teachers and counsellors must become aware of differences in cognitive style among students of similar ability level. This may be addressed in both pre-service and in-service training, so that teachers become open to recognising intellectual ability which

does not manifest itself readily in a successive oriented education system. Once such talent is recognised teachers need skills to implement programs which allow students to respond in accordance with their cognitive style.

Alteration of the curriculum is desirable not only in terms of content, but also along the dimension of processes and skills. This is illustrated in Figure 16, a diagram adapted from one presented by Dr. Eddie Braggett at an inservice seminar for teachers (Canberra, 1984). The double hatched area in the upper right quadrant represents the area into which the curriculum needs to be expanded to meet the needs of gifted students and, in particular, the 'simultaneous' processors. To date most programs for gifted students have emphasised the content dimension, ignoring the significant impact of cognitive style on school experience and satisfaction. Maker (1982), explores several relevant areas of curriculum modification in her discussion of curriculum development for the gifted. Many may be equally well applied to an unstreamed classroom, allowing each student to respond at his/her own level. Other useful references in this regard are the SOLO (Structure of Observed Learning Outcomes) Taxonomy of Collis and Biggs (1980), and Grant's (1983) suggestions for designing classroom tasks to meet the needs of different ability levels within the group.

In approaching the predicament of gifted girls several strands of intervention are required. Again, at both pre-service and in-service levels the awareness of teachers must be raised to the disparate attention and reinforcement given to gifted boys and girls. Second, awareness must be raised of the assumption that

FIGURE 16. Directions For Curriculum Differentiation.



gifted girls will also be socially compliant. Teachers may need to separate classes, at least occasionally, into single sex groups in order to sensitize themselves to the action information which may reveal the potential of female students. Deliberate efforts must be made to raise girls' participation level in the classroom, and to ensure that their efforts are equitably valued and rewarded.

6.4.CONCLUSION.

It remains to state clearly that the needs based curriculum recommended above and improvement in the classroom status of girls, are desirable not only for gifted students, but for all students. The implementation of such programs would provide opportunities for all students to demonstrate their abilities and potential. As Ryan eloquently argues, such strategies place "the curriculum emphasis upon meaningful and significant teaching and learning" (1982, p.159). In a regular classroom it is possible to achieve these aims, only when the curriculum becomes not only product oriented, but also process oriented.

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APPENDIX I

STUDENT QUESTIONNAIRE

Instructions : The following questions make use of a rating scale with seven places; please mark the place that best describes your opinion .

1. Being at school is, for me, generally -

- a) boring _____ : _____ : _____ : _____ : _____ : _____ : _____
interesting
extremely : quite : slightly : neither : slightly : quite : extremely
- b) enjoyable _____ : _____ : _____ : _____ : _____ : _____ : _____
unenjoyable
extremely : quite : slightly : neither : slightly : quite : extremely
- c) punishing _____ : _____ : _____ : _____ : _____ : _____ : _____
rewarding
extremely : quite : slightly : neither : slightly : quite : extremely
- d) valuable _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless
extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

2. School assignments are, on the whole -

- a) easy _____ : _____ : _____ : _____ : _____ : _____ : _____
difficult
extremely : quite : slightly : neither : slightly : quite : extremely
- b) challenging _____ : _____ : _____ : _____ : _____ : _____ : _____ **routine**
extremely : quite : slightly : neither : slightly : quite : extremely
- c) punishing _____ : _____ : _____ : _____ : _____ : _____ : _____
rewarding
extremely : quite : slightly : neither : slightly : quite : extremely
- d) important _____ : _____ : _____ : _____ : _____ : _____ : _____
unimportant
extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

3. My classmates consider success at school to be -

a) **important** _____ : _____ : _____ : _____ : _____ : _____ : _____
unimportant

extremely : quite : slightly : neither : slightly : quite : extremely

b) **valuable** _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless

extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

4. My classmates consider my contributions in class to be -

a) **bad** _____ : _____ : _____ : _____ : _____ : _____ : _____ **good**

extremely : quite : slightly : neither : slightly : quite : extremely

b) **valuable** _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless

extremely : quite : slightly : neither : slightly : quite : extremely

c) **interesting** _____ : _____ : _____ : _____ : _____ : _____ : _____ **boring**

extremely : quite : slightly : neither : slightly : quite : extremely

d) **pleasing** _____ : _____ : _____ : _____ : _____ : _____ : _____ **annoying**

extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

5. My teacher(s) consider(s) school success to be -

a) **important** _____ : _____ : _____ : _____ : _____ : _____ : _____
unimportant extremely : quite : slightly : neither : slightly : quite : extremely

b) **worthless** _____ : _____ : _____ : _____ : _____ : _____ : _____ **valuable**
 extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

6. My teacher(s) consider(s) my contributions in class to be -

a) **bad** _____ : _____ : _____ : _____ : _____ : _____ : _____ **good**
 extremely : quite : slightly : neither : slightly : quite : extremely

b) **valuable** _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless extremely : quite : slightly : neither : slightly : quite : extremely

c) **interesting** _____ : _____ : _____ : _____ : _____ : _____ : _____ **boring**
 extremely : quite : slightly : neither : slightly : quite : extremely

d) **pleasing** _____ : _____ : _____ : _____ : _____ : _____ : _____ **annoying**
 extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

7. My parents consider school success to be -

a) unimportant _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____
important

extremely : quite : slightly : neither : slightly : quite : extremely

b) valuable _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless

extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

APPENDIX II

TEACHER QUESTIONNAIRE

STUDENT NAME - _____

Instructions : The following questions make use of a rating scale with seven places; please mark the place that best describes your opinion.

1. To cater for him/her in my class is-

- a) difficult _____ : _____ : _____ : _____ : _____ : _____ : _____ easy
 extremely : quite : slightly : neither : slightly : quite : extremely
- b) rewarding _____ : _____ : _____ : _____ : _____ : _____ : _____
 punishing extremely : quite : slightly : neither : slightly : quite : extremely
- c) challenging _____ : _____ : _____ : _____ : _____ : _____ : _____ routine
 extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

2. His/her contributions in class are -

- a) valuable _____ : _____ : _____ : _____ : _____ : _____ : _____
 worthless extremely : quite : slightly : neither : slightly : quite : extremely
- b) original _____ : _____ : _____ : _____ : _____ : _____ : _____
 stereotyped extremely : quite : slightly : neither : slightly : quite : extremely
- c) pleasing _____ : _____ : _____ : _____ : _____ : _____ : _____ annoying
 extremely : quite : slightly : neither : slightly : quite : extremely
- d) superior _____ : _____ : _____ : _____ : _____ : _____ : _____ inferior
 extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

3. Classmates consider his/her presence in the class to be -

a) **beneficial** _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____ **harmful**
 extremely : quite : slightly : neither : slightly : quite : extremely

b) **annoying** _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____ **pleasing**
 extremely : quite : slightly : neither : slightly : quite : extremely

c) **valuable** _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

4. Having him/her in my class leaves me feeling -

a) **weak** _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____ **strong**
 extremely : quite : slightly : neither : slightly : quite : extremely

b) **relaxed** _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____ **tense**
 extremely : quite : slightly : neither : slightly : quite : extremely

c) **comfortable** _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____ **uneasy**
 extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

5. His/her parents consider his/her school experience to be -

a) important _____ : _____ : _____ : _____ : _____ : _____ : _____
unimportant

extremely : quite : slightly : neither : slightly : quite : extremely

b) worthless _____ : _____ : _____ : _____ : _____ : _____ : _____
extremely : quite : slightly : neither : slightly : quite : extremely

valuable

REASONS

6. My supervisors consider programming for children like him/her to be -

a) easy _____ : _____ : _____ : _____ : _____ : _____ : _____
difficult

extremely : quite : slightly : neither : slightly : quite : extremely

b) unimportant _____ : _____ : _____ : _____ : _____ : _____ : _____
important

extremely : quite : slightly : neither : slightly : quite : extremely

c) valuable _____ : _____ : _____ : _____ : _____ : _____ : _____
worthless

extremely : quite : slightly : neither : slightly : quite : extremely

d) necessary _____ : _____ : _____ : _____ : _____ : _____ : _____
unnecessary

extremely : quite : slightly : neither : slightly : quite : extremely

REASONS

7. My colleagues consider programming for children like him/her to be -

a) easy _____ : _____ : _____ : _____ : _____ : _____ : _____
 difficult
 extremely : quite : slightly : neither : slightly : quite : extremely

b) unimportant _____ : _____ : _____ : _____ : _____ : _____ : _____
 important
 extremely : quite : slightly : neither : slightly : quite : extremely

c) valuable _____ : _____ : _____ : _____ : _____ : _____ : _____
 worthless
 extremely : quite : slightly : neither : slightly : quite : extremely

d) necessary _____ : _____ : _____ : _____ : _____ : _____ : _____
 unnecessary
 extremely : quite : slightly : neither : slightly : quite : extremely

REASONS
