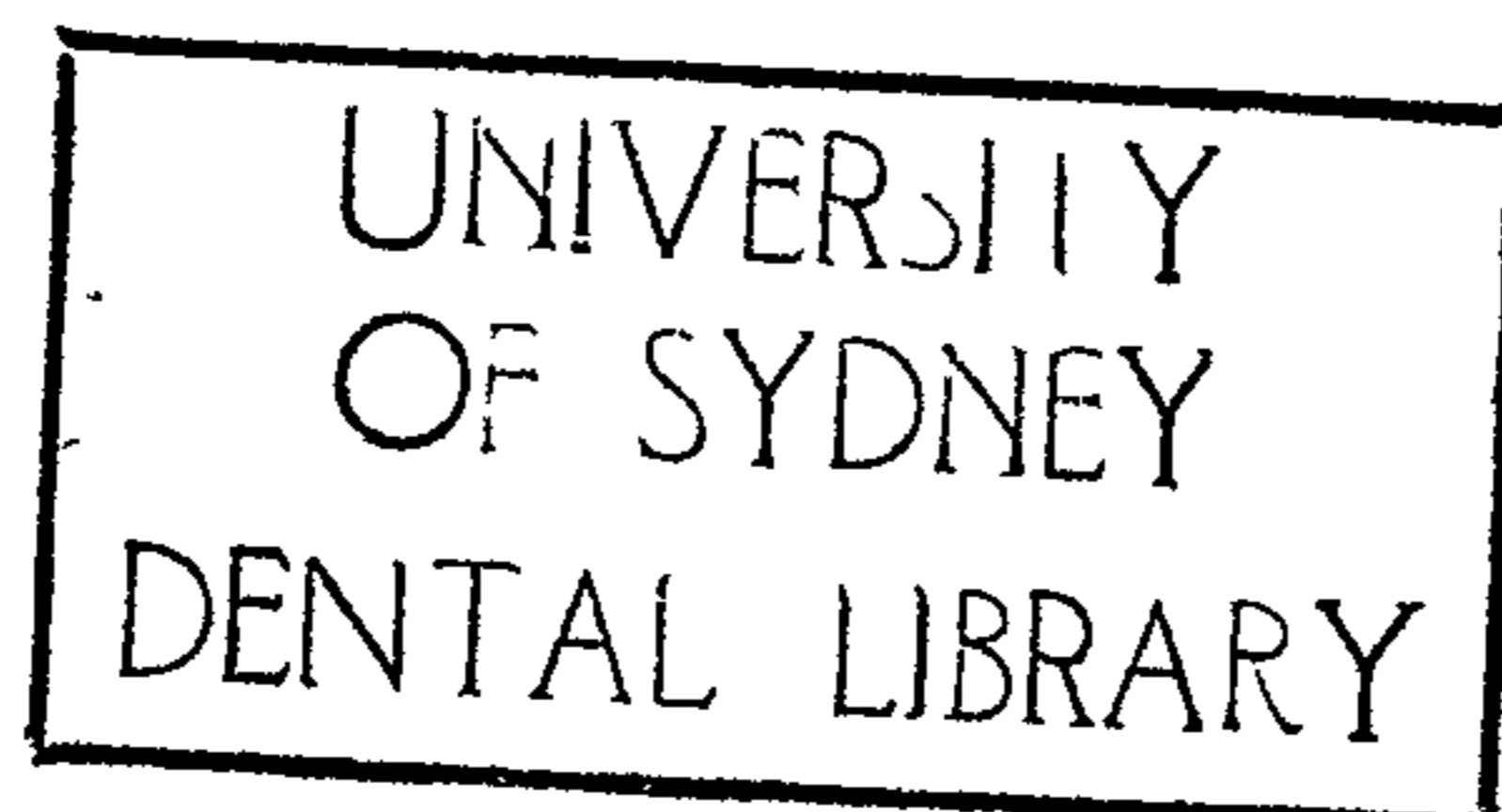


PATIENT ATTITUDES TO ORTHODONTICS  
AND THEIR EFFECT ON  
BEHAVIOUR IN TREATMENT.

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DEDICATION.

To my family, my parents and brother, my sons,  
Ben and Tom and my husband Chris, for their unstinting  
loyalty, unselfishness and constant encouragement.

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(Diagram 1).

How often are we confronted  
with such an expression?"

"No amount of attention by the orthodontist to sophisticated technique is likely to have much effect if those efforts are met with resistance or indifference on the part of the patient."

A. Barbour & R. S. Callender (1981).

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PART ONE.

INTRODUCTION.

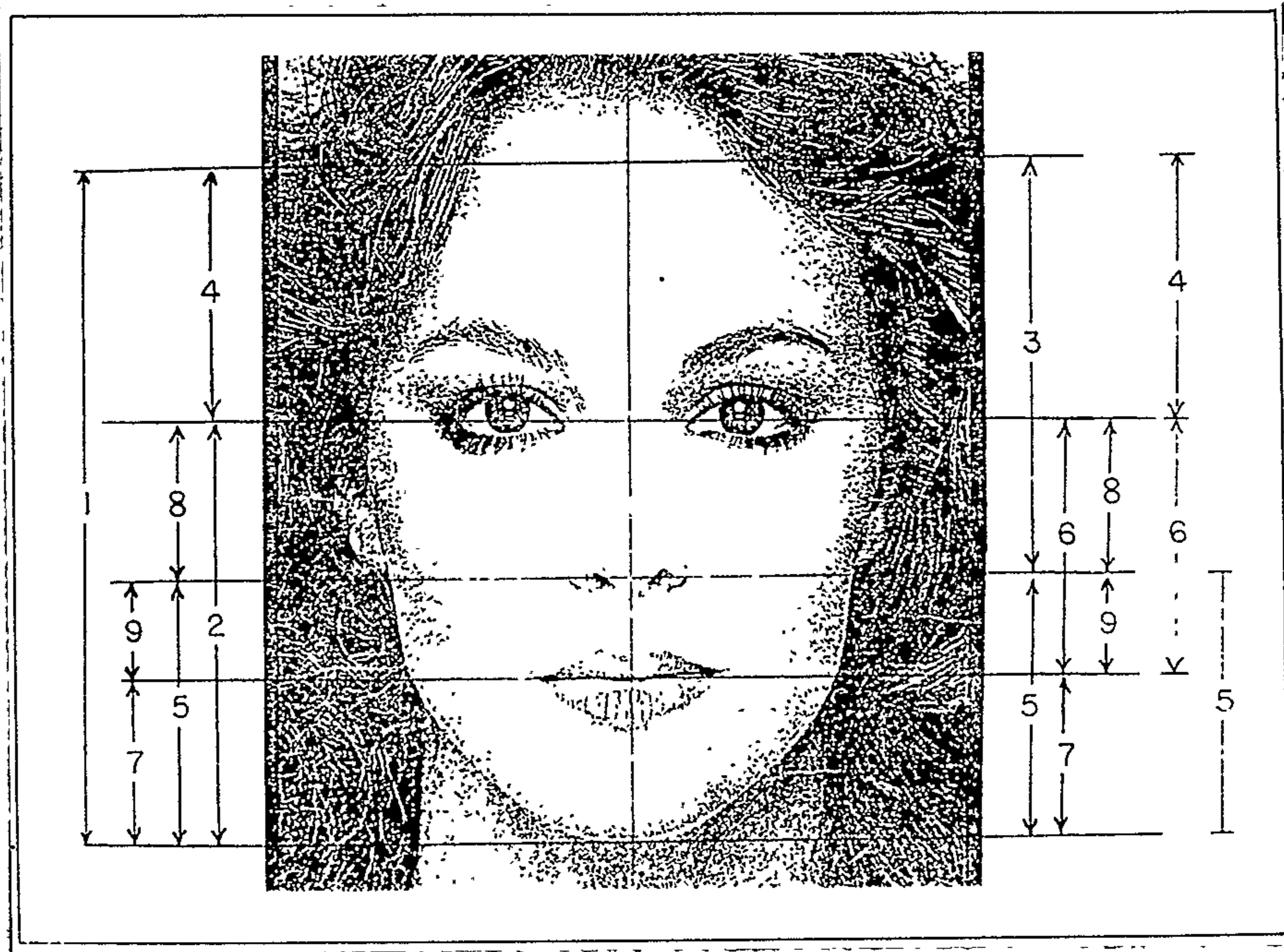
A malocclusion may be seen from: a functional and an aesthetic point of view.

The unfavourable functional consequences which have been associated with malocclusion are: periodontal disease, mastication and digestive problems, speech problems, caries and temporomandibular joint problems. Research indicates that it is doubtful whether these are the results of malocclusion. (Freer 1974, Poulton & Aarouson 1961, Harvey 1980) and it has even been suggested that some factors may be the result of orthodontic treatment (Sadowsky & Begole 1981, Smith 1981, Harvey 1980, Brabant 1981, Muhler 1970, Shannon 1981, Zachrisson 1971).

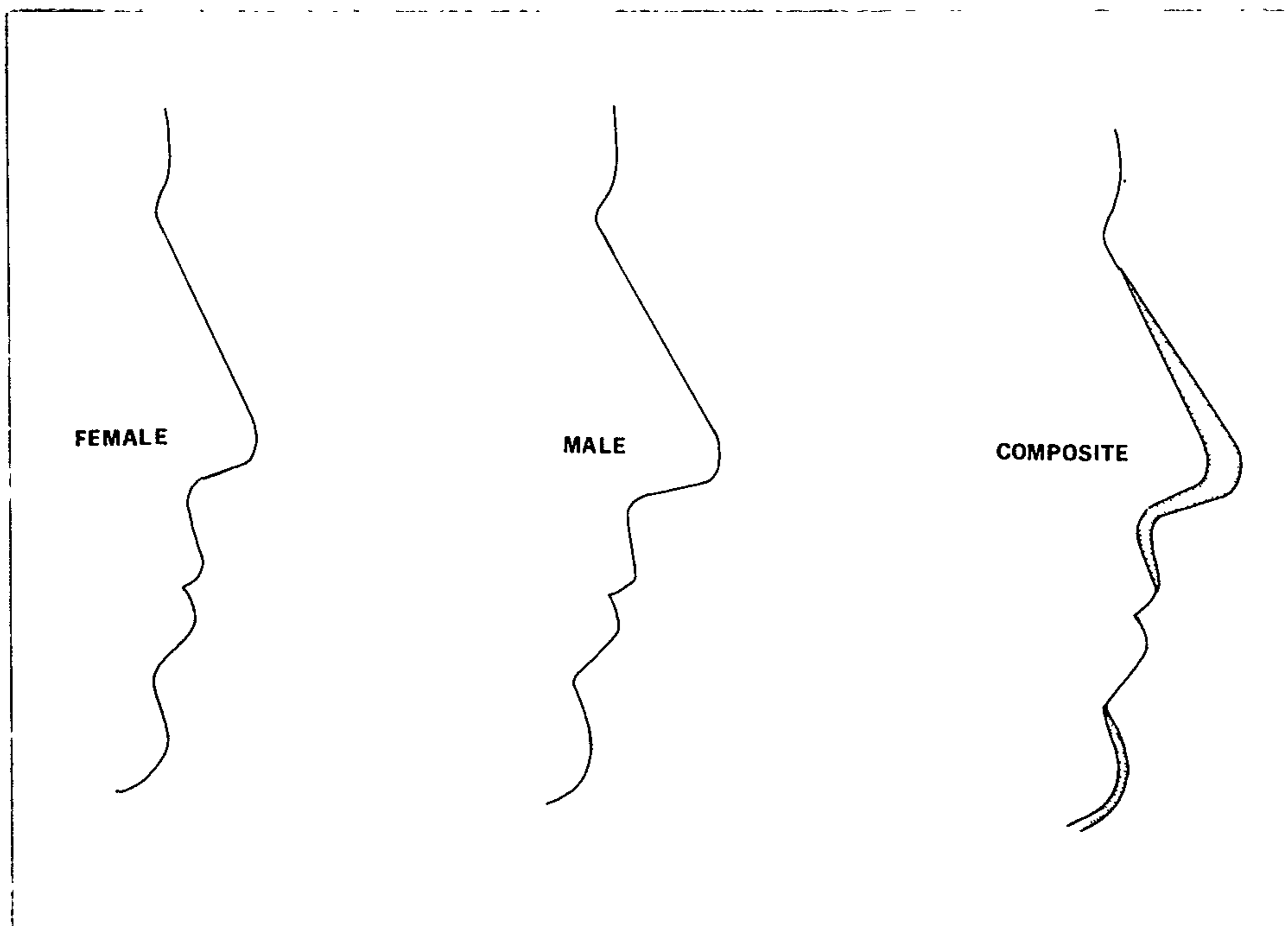
The unfavourable aesthetic consequences associated with malocclusion are perceived differently by Professional and Layman.

The professional (dentist, orthodontist) tends to view aesthetics in relation to ideal measurements on models and radiographs (Fisk 1963). Facial harmony and "normal" or "ideal" occlusion are not always synonymous. Improved occlusion may be achieved in some cases at the expense of facial harmony (Nigel 1959, Cox & Van der Linden 1971). Cox & Van de Linden (1971) believe cephalometric normal values to be too rigid and the use of facial profiles is not necessarily desirable since most patients would not view themselves from a full profile position. In addition, they believe, the values used by the orthodontists do not take into consideration other aspects of beauty, e.g., prominence of cheek bones and movements of the face during speech and facial expression. Reidel (1950) refers to Hellman's report on the Angle concept of perfection as existing with normal occlusion, and the Apollo profile as the ideal. These ideals, he believes, are objective, not subjective, that "normal" occlusion does not necessarily exist and is not necessarily beautiful. Ricketts (1981, 1982), on the other hand, refers to the "Divine Proportion" - a ratio existing in nature "beautiful to the human eye and comforting and pleasing to the human psyche". He believes that this proportion or ratio is linked to growth and related to optimum function. This may aid objective assessment of appearance (see Diag. 2). Reidel believed that, since orthodontically it

is not possible to change anything beyond the alveolar process, a more subjective opinion must be sought, if the orthodontist is to come anywhere near understanding patient expectation. Lines, Lines & Lines (1978) did just this and found a statistically significant sexual preference for aesthetically pleasing profiles. (See Diag. 3).



(Diagram 2).  
 Ricketts' (1981 "Divine Proportion")



(Diagram 3).  
 Lines, Lines and Lines (1978)  
 Sexual Preference for Profiles.

The need for subjective opinion is particularly indicated, it would seem, where malocclusions are minor. It has been shown that, as the apparent severity of the malocclusion decreases, the inter examiner variability increases. (Freer, Grewe and Little 1973). The lay perception of beauty is discussed by Peck and Peck (1970). They refer to the changing perception, from Paleolithic man, where "conscious consideration of beauty was negligible, daily existence demanding rapt attention to earthly necessities", to Egyptian times (see Diag. 4) where bimaxillary prognathism was considered beautiful, through the period of the Greek culture and Apollo, the Romans and to the Middle Ages, where suppression of individual variation took place. The Renaissance (see Diag. 5) brought about the development of a classical form of beauty and physiognomists sought personality traits and biological truths from facial features. Modern man (see Diag. 6) has developed abstract interpretation from aesthetics. They believe presumptive judgements are made from certain facial types, e.g., severe class iii and class ii malocclusions suggest dull, slow individuals (Prahall Anderson 1978, 1979). Peck and Peck (1970) refer to Wendell Wylie's study which showed that aesthetic judgements took place regardless of nationality, age, sex and occupation. Judgements, they believed, were variable within these groups and from group to group. They believed, therefore, that there is a need to acknowledge patients' and parents' perception of faces at the pre-treatment phase.

The fact that the majority of individuals seek orthodontic treatment mainly for aesthetic reasons, is commonly agreed. (Crawford 1970, Ingervall and Hedegard 1974, Shaw, Lewis and Robertson 1975, Fisk 1963, Starobach and Kaplan 1975), but not all of those with malocclusions thought significant by the profession, proceed with treatment. (Myreberg and Thilander 1973, Ingervall and Hedegard 1974, Goldstein 1969) and not all those who desire treatment have malocclusions considered significant by the profession. (Lewitt and Virolainen 1968, Cohen and Horowitz 1970, Shaw 1981 B.).

The significant difference in the evaluation of dentofacial morphology between patients and professional groups has been discussed by a number of authors. (Prahal-Anderson, Boersma, Van der Linden and Moore 1979). Shaw, Lewis and Robertson (1979) stated that: (1) "If the orthodontist has a scale of aesthetics with regard to teeth, that differs from the community at large, he may tend to over-prescribe treatment when his opinion is sought" and (2) "if there are degrees of irregularity which are acceptable to the community, this may have implications, not only in the assessment of need, but also in the amount of orthodontic correction which should be aimed at. Literature indicates that the popularity, personality and general appearance of the individual child has considerable bearing on how much of a handicap the malocclusion actually is - generalisations are likely to be misleading and often inappropriate to the needs of the individuals". Fisk's (1963) statement that "aesthetics is a problem when it is a cause for concern" should be looked at more closely, and Prahal-Anderson (1978) stated this same concept when he said "malocclusion is a handicap when there is an adverse effect on social relationships. It is not necessarily a functional disability". Cohen (1970) again stated the same when she said that "an oral characteristic is a handicap only when it is seen as a barrier to the accomplishment of particular goals. This implies that a given occlusal condition, whether it represents a norm or a deviation from it, may or may not be seen as a physical handicap".

The orthodontist is as Duncan (1977) states "a teacher, a staff manager and a patient manager". A knowledge, therefore, of the social and psychological effects of aesthetics on an individual is necessary for the assessment of patient attitudes and needs and as an aid to prediction of behaviour. (Jenny 1975, Shaw Meeks & Jones 1980, Fisk 1963, Shaw 1981 B, Stricker, Clifford, Cohen, Giddon, Meskin, Evans 1979, Stricker 1970).



(Diagram 4).  
Egyptian "beauty"?



(Diagram 5).  
Classical Victorian "beauty"?



(Diagram 6).  
Modern "beauty"?

The literature review has been divided into the following sections:-

Attitudes of others to an individual and treatment

- teachers
- parents
- peers.

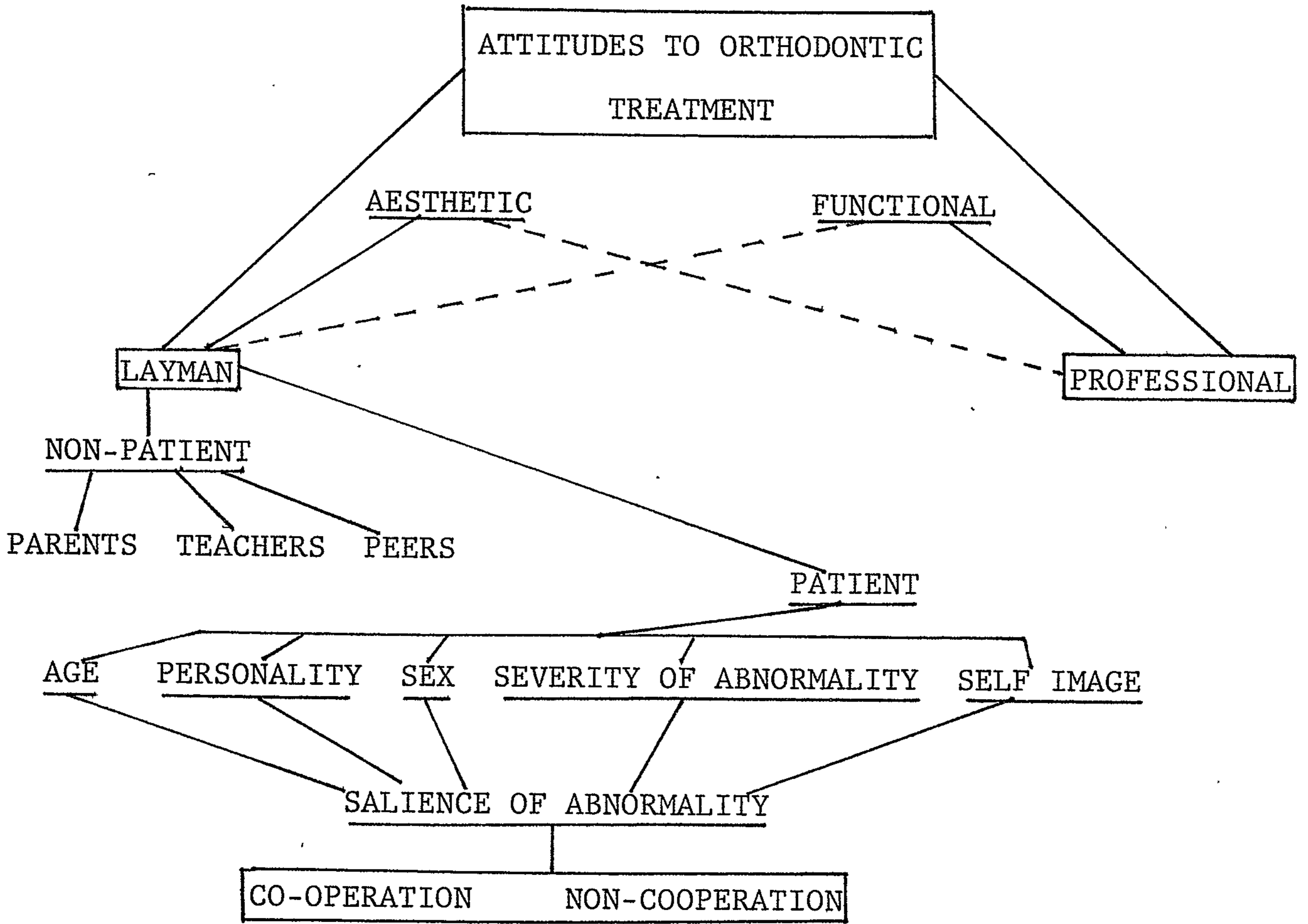
Attitudes of individuals to self and to treatment

- self concept and body image
- patient perception and its effects
- degree and type of abnormality and its effects.

Assessment of treatment need and desire

- indices
- individual predictors of behaviour.

The Adolescent and his behaviour: the effect on treatment.



LITERATURE REVIEW.

ATTITUDES OF OTHERS TO AN INDIVIDUAL  
AND TREATMENT.

The psychological effects of appearance and its effects on behaviour have received a good deal of attention (Landsdown 1981). Dion & Berscheid (1972) found an interaction between attractiveness and the severity of reported behaviour of an individual. In fact, teachers have been shown to perceive good looking children as having higher I.Q., being more likely to go on to a tertiary education and having more caring parents. (Clifford & Walster 1973 reported in Lansdown 1981). Shaw (1980) showed, however, that perceived attractiveness had a negligible part in determining judgements by teachers of academic and personal characteristics. The difference in the conclusions may be related to different methods of testing and different environments.

Despite the fact that most adults, in particular parents, stated that good dental appearance was important for all, more parents thought that treatment was more important for girls than boys (Baldwin & Barnes 1965, Dorsey & Korabik 1977). They found, as did Lewitt & Virolainen, that the decision for treatment was generally made by the mother. This was particularly true if the mother had experienced orthodontic treatment herself.

Both Baldwin & Barnes (1965), Dorsey & Korabik (1977) and Linn (1965) found there was little difference in the acceptance of treatment with varying socio-economic levels. Different reasons for the need for treatment were given, however. Those individuals of higher socio-economic levels cited psychological reasons for the need, whereas those of lower socio-economic levels cited social reasons. This was believed to be related to the "upward striving factor" present in the lower socio-economic levels. Starnbach & Kaplan (1975) found motivation varied little with income but found some relationship between employed and self-employed groups. They found those from an employed background

tended to have a more positive attitude towards orthodontic treatment.

Story (1966) suggests that the attentiveness paid to a young daughter by a father, or a mother to her son, could be related to an unconscious romance between the parent and child. He believes these are usual and normal feelings, but, of course, there is no guarantee that the child will see things the way the parents (and the orthodontist) see them, and be the "obedient patient".

Secord and Muthard (1955) found that age and sex of subjects played a large part in their perception of a woman's face (i.e. when presented with her photograph). Secord and Jourard (1953, 1956) say that thinking on social perception suggests that many personal factors, e.g., values, needs, cognitive structures, will influence an individual's cognitive behaviour. They felt, however, that testing of these factors was extremely difficult.

In view of these and other findings, Baldwin & Barnes' (1966) conclusion that the desire for treatment by a family was unrelated to the severity of the child's dentofacial problem, seems quite logical. Rather than aesthetics, as such, being the major factor, achievement need, social aspiration and other social and psychological factors were the motivational factors in parents' desire for treatment of children. Norton and Markowitz (1971) believe that the reasons for a family seeking treatment of a malocclusion have less to do with the child than the narcissistic needs of the parents, through identification with their children. They refer to the overt and covert attitudes of parents - in particular the guilt feelings. They believed that parents may feel guilty at having produced a child with an abnormality or may feel guilty if the condition is left untreated. Other adults may believe them to be inadequate parents! Both overt and covert attitudes may be justified, they believe, but the nature of these makes assessment and hence communication difficult.

Baldwin and Barnes (1967) found that children tended to be influenced by the attitudes of adults, but were more

likely to see treatment in terms of the immediate advantages for their own sex and age. Why an adolescent does not always see things in quite the way his parents, and often his orthodontist do, with respect to his malocclusion, is clearly the area in which many "motivational problems" in orthodontics lie. Norton and Markowitz (1971) and Story (1966) agree with those points. Wheeler (1961) showed that, at varying stages of maturity, appearance is of varying importance. This is affected by the sex of the individual, to a large extent also. He believes that, in early adolescence there is a greater emphasis on personal and physical prowess - physique being a more important factor than detailed beauty. (See Diag. 7 & 8). Norton and Markowitz (1971) refer to the desire for untidiness in the early adolescent male and state "the child will eventually discover girls and soap about the same time". Harper & Collins (1973) echoed these findings when they stated that the "euphoric traits" (friendliness, cheerfulness, enthusiasm, humour) were generally more highly valued during adolescence. These basic differences in values, combined with the fact that there is an ever increasing demand in the adolescent for independence from parental (adult) control and an increase in peer group affiliation (Hickman 1971), Dunphy 1963) make peer group influences, in certain situations, far greater than those of parents. (See Diag. 9).

Despite the above-mentioned factors, the effects of appearance as such, in peer group situations cannot be underestimated. Dion & Berscheid (1974) found that, as early as 4 - 6 years of age, unattractive children were relatively less popular than attractive children. The males in particular, were more frequently nominated as exhibiting more antisocial behaviour, than attractive children. Attractive children tended to be perceived by their peers, as more self-sufficient and independent in behaviour than unattractive children and they believed that there was a relationship between early social behaviour and adult social adjustment. The social effects of appearance were also seen by Walster Aronson & Abrahams (1966) in their study relating to importance of appearance on the dating behaviour of



(Diagram 7).  
Adolescent physique.



(Diagram 8).  
The importance of physical prowess  
to the early adolescent.



(Diagram 9).  
Peer group influence far greater  
than that of parents.



(Diagram 10)  
Little difference in salience  
with different races.



He concluded that there was social disadvantage in dento-facial anomalies, but that the response was variable - the ability to compensate was variable and that this ability should be looked at more closely.

Linn (1966) believed "comeliness is a background to, rather than a facilitator of social exchange. What becomes germane is a deviation, since it can intrude on the social situation".

#### SUMMARY.

The attitudes of others (parents, teachers, siblings, peers) may be summarised as overt (reasons given when questioned) and covert (reasons felt but rarely given when questioned, or felt unconsciously and unable to be given). These reactions may be mainly caused by the concern for the psychological or social effects of the problem or be related to the severity of the problem. This, in turn, may be complicated by guilt feelings experienced by a parent, the sex of the individual and the adjustment or maladjustment of the individual with the problem.

ATTITUDES OF THE INDIVIDUAL TO SELF  
AND TREATMENT.

The statement by Shaw (1980) that "other characteristics of an individual" will influence the response of the individual to the reactions of others to his facial features, leads to the investigation of the following:

Self Concept and Body Image.

The two are positively related. (Rosen and Ross 1968, Klima, Witteman and McIver 1979). Secord and Jourard (1956) felt that an individual's attitudes towards his body are of crucial importance to any comprehensive theory of personality. They refer to Body Cathexis; the degree of feelings of satisfaction or dissatisfaction with various parts or processes of the body. They found that:

- i) Feelings about the body are commensurate with feelings about self when both are appraised by similar scales. They were correlated but separate.
- ii) Negative feelings about the body are associated with anxiety in the form of undue autistic concern with pain, disease or body injury.
- iii) Negative feelings about the body are associated with feelings of insecurity involving self.

Musa and Roach (1973) found a relationship between "self-evaluation of personal appearance and personal adjustment", and Pitt and Korabik (1977) substantiated these findings when they found that self-concept does not appear to be appreciably influenced by objective appearance and that perception of facial profile is determined by an individual's self satisfaction. Katz (1978) found that personal self satisfaction with oral appearance was related to factors most visible and easily assessed by the lay person. They do not mention overall self satisfaction or whether the measured oral self satisfaction was related to a desire for treatment.

Klima, Witteman and McIver (1979) found that there was little change in self-concept from pre-orthodontics to

retention stages. Conversely, Dennington and Korabik (1977) found significantly lower self-concept levels in those with untreated malocclusions (compared with the norm). They found a significant increase with treatment, bringing the treated cases closer to normal values. The difference in testing method may account for the difference in results. The latter study retested patients early in treatment, at a time when dental changes were most dramatic. The former study looked at patients at the end of treatment when the initial enthusiasm may have worn off. Oullette (1979) carried out a survey of those who had undergone facial surgery to determine their satisfaction or dissatisfaction with treatment. The vast majority stated that they were satisfied and a majority felt it had brought about significant changes in their life-style, mainly concerning confidence in themselves. These results may be partly due to the magnitude of the original abnormality and purposeful positive thinking. Rutzen (1973), on the other hand, found relatively small differences between individuals treated and untreated. He believed, however, that this did not permit the unequivocal rejection of the possibility that:

- i) Orthodontic treatment makes little or no social difference.
- ii) Malocclusion may not serve as a basis for social discrimination (other evidence suggests that it does - see previous section).

He believed that untreated persons compensate in their role performance. This seems most likely from further evidence.

Klima Witteman and McIver (1979) found:

- i) Marked difference in the patient's measured self-concept level and the mother's idea of what it was.
- ii) There was little variation in self-concept with age.
- iii) Girls scored lower than boys (this was shown again by Musa and Roach 1973).

Starnbach and Kaplan (1975) found girls to be more co-operative in treatment than boys. This may be due to the lower self image supposedly existing in girls or the fact that they mature earlier and take a more adult attitude to orthodontics, they felt.

### Patient Perception and its Effects.

MacEwan (1958) discussed the prevalence, unavoidability and importance of illusory phenomena. He related this mainly to the orthodontist, in his judgement as to patient aesthetics, but his findings must create some doubt as to the layman's ability to recognise his own or other's malocclusion. Giddon, Hershon and Lennartsson (1974) found a significant discrepancy between the objective and subjective profile measures of individuals. The ability of an individual to recognise his own profile is in doubt, according to their study. They did, however, suspect that the method used may be partly responsible for this result.

Cohen and Horowitz (1970) and Horowitz, Cohen and Doyle (1971) showed that children who perceived themselves as having a particular occlusal condition, tended to rank that condition on the preferential hierarchy, either as high or a little higher than those who did not perceive themselves with that condition. This was thought to be an effort to reduce the stigma associated with that condition. Graber and Lucker (1980) however, carried out a study involving 481 subjects (males and females, 10-13 years old) where they found that patients were able to judge and identify malocclusion. They found that the majority (even those with significant, by orthodontic standards, malocclusion) were satisfied with their appearance. They felt that there was a broad range of acceptability. They found a significant sexual dimorphism. Facial form (i.e., overjet) was of greater importance to the female subjects and dental crowding more important to the males.

These results indicate that studies relying on patient perception are subject to a number of undefinable factors and, as a result, reliability may be in some doubt.

### Degree and Type of Abnormality and its Effect.

Watson (1964) found that there were no significant differences in the Rogers Personal Adjustment Inventory scores, measuring self-concept of three groups:

- a) Cleft lip and palate.
- b) Other chronic physical handicaps
- c) No known chronic physical handicaps.

McGregor (1951) states, however, that facial deformity may cause anxieties and a need for a defense mechanism buildup - energy which he believes might otherwise be channelled into a more positive aspect of living. This is in keeping with the thoughts of Rutzen (1973). In 1970, however, he states (as does Shaw 1981 B) that personality and the overall self-concept of the individual play a large part in the "adjustment" possible. Facial deformity, in the area of the mouth (which Story believes is "the centre of communication") is significant. Facial deformity which produces an uncertain response in others, making personal adjustment more difficult, is more likely to have a debilitating effect on the personality of the individual. He believes malocclusion could fall into this category.

#### SUMMARY.

The attitude of an individual to his or her problem is related to the attitudes of others, the age of the individual, his or her sex, the severity of the problem and the individual's self-image and personality.

ASSESSMENT OF TREATMENT NEED  
AND DESIRE.

In an effort to recognise a patient need for treatment, indices were developed.

Angle's classification served as the most popular and useful until the 1950's (Katz 1978).

Katz (1978) reports that a more sophisticated index was seen as necessary in the United States - something which would not only categorize patients, but provide a basis for selection of orthodontic patients. He refers to the early attempts by Massler and Fränkel in 1951 and by Van Kirk and Pennell in 1958. He believed that Draker's Handicapping Labiolingual Deviation Index (H.L.D.) was the first index designed to meet the administrative needs of programme planners. Draker (1960) stated he used this to allow epidemiological separation of supposedly handicapping labiolingual deviations from lesser orthodontic considerations. His use of a fictitious norm was a limitation. He did, however, along with the Occlusal Feature Index (O.F.I.), developed by the National Institute of Dental Research, give consideration to the total dental arch, unlike previous indices (Katz 1978). The Treatment Priority Index (T.P.I.), developed by Grainger soon after this, was believed by Katz to introduce a new level of sophistication. It was designed to eliminate the arbitrary nature of earlier indices. This still did not take into consideration the growing demand to assess the aesthetic judgement that was obviously a part of each decision regarding orthodontic treatment.

The first popular index which attempted to measure the aesthetic factor was the Eastman Esthetic Index developed by Howitt, Stricker and Henderson (1967). This was essentially an objective index of dental aesthetics. They stated that aesthetics and sociological conditions were by far the greater cause of patients seeking orthodontic treatment.

One of the latest of the popularly accepted indices was developed by Salzman (1966, 1967) and the A.A.O. Council of Orthodontic Health Care. Salzman's Handicapping Malocclusion Assessment Record (H.M.A.R.) incorporated most of the measurements of the earlier indices and organised the

data in compact form.

McCann (1967) discussed the importance of measurement of psychological criteria but stated that a precise measurement of the impact of malocclusion on personality development and mental health would be beyond the attainment of a biostatistically based parameter for objective and qualitative measurement. This, he believed, would apply as long as the individual retained his powers of rationalization and good sense and an ability to adjust to minor imperfection - i.e. individual compensation.

In 1970 Carlos stated that attempts to establish the validity of an index intended for administrative use was often unsuccessful since the reference criterion (clinical judgement) was difficult to standardise. Katz (1978) subsequently carried out a study involving 162 patients, to determine the relationship between eight widely used orthodontic indices (mentioned previously) and the patient's oral self-image satisfaction level. The questionnaire employed to determine oral self-image was that which was used in part of the Eastman Esthetic Index. Katz believed it to be recognised as one of the better assessors dealing with such a subjective study. The direction of all detected differences always indicated that the subjects who scored highest on the orthodontic indices were more dissatisfied with their appearance. He believed that this was a strong indication that a measurable psycho-social aesthetic component does exist. Angle's classification was found to be the most influential index. Katz concluded that the questionnaire was general and although addressing the issue does not evaluate the desired psycho-social aesthetic factor and that the orthodontic indices, at best, make only a partial effort to measure this psycho-social aesthetic factor.

Slakter, Albino, Green and Lewis (1980) have since then established that the treatment Priority Index developed by Grainger is valid and useful as a screening device in the population at large.

It seems, however, that the use of indices may best be confined to research and for predictive measures of a population.

Story (1966), Feldstein (1959) and Massler (1962) all stressed the need for predictors as an aid to determining a method of individual behaviour modification. In a search for individual predictors Crowley Klebanoff (1956) found a low correlation between oral aggressivity/passivity element (see Appendix II - Glossary) and co-operation. They concluded that other significant factors must be present.

Allan and Hodgson (1968) used the Adjective Check List to determine personality characteristics most associated with co-operative patients. They found a co-operative patient to be 14 years of age, (or younger), enthusiastic, outgoing, energetic, wholesome, self-controlled, responsible, trusting, determined to do well, hardworking, forthright and obliging. Lewitt and Virolainen (1968) found that adolescents more independent of parental wishes, were found to have less positive attitudes to orthodontics. However, when this group of individuals displayed a greater internalised locus of control (see Appendix II - Glossary) and were also more independent of their peers, they were more likely to have positive attitudes. These results were found with middle class subjects. There was a greater variability among working class subjects.

Kreit, Burstone, Delman (1968) found that the most salient characteristics of patients rated as unco-operative were:

- the existence of a poor relationship with their parents.
- a greater likelihood of requiring the presence of an authority to enforce ethical standards of behaviour.
- a greater likelihood of feeling that their friends often made fun of what they had to say.
- a greater likelihood of going along with the latest teenage fads.

They believed that the factor of wanting to belong to a peer group but being set apart by other factors, while at the same time attempting to free themselves from identifications with their parents, was responsible for these attitudes to orthodontics.

Burns (1970) was able to show that orthodontic patient's co-operation or non co-operation during treatment was not related to the treatment itself, but was a manifestation of basic personality. In addition, those judged to be non co-operative by the orthodontist, were also judged non co-operative by a school teacher.

Lewis and Brown (1973) carried out a study to find what orthodontic "worries" were present in orthodontic subjects. All subjects were co-operative. When compared with every day "worries", the orthodontic "worries" were found to be minor. They found the major concerns related to:

- remembering to wear the appliance,
- concern about others' reaction to their appearance.

There was little concern for pain and no differences in results were seen between boys and girls. They concluded that a patient who is "of a worrying disposition" will be most anxious and that a little of this may be a good thing. The questions, selected from the Gordon Scale, they thought, may have been somewhat simplistic.

Crawfort (1974) used a multiple regression analysis of patient co-operation. His aim was to determine the variables most significantly related to patient co-operation. He found:

- 1) younger age and
- 2) locus of control of personality were strongly associated with co-operation.

but he found:

- 1) parental regard for the child,
- 2) need for heterosexual affection and attention and
- 3) a lack of involvement of the patient in the decision for treatment

were only fairly strongly associated with co-operation.

Colenaty and Gabriel (1977) found a significant relationship between ego strength, lack of trust, age and co-operation.

Swetlik (1978) divided his subjects into two groups, using extra oral elastic and coil spring traction devices. He tested to determine whether locus of control and scores on "Childrens's Social Desirability Scale" were correlated with co-operation. He found that those with a high score

in the latter to be, after nine weeks treatment, above average in co-operation. How the scale was comprised and the exact method used is not clear from the report.

Miller and Larson (1979) attempted to measure the impact of aggression, pain, authority, invasion and social acceptance upon patient co-operation in orthodontic treatment. Whether or not their test was a reliable predictor is still doubtful. They found, however, that there was a strong relationship of co-operation with authority and social acceptance.

Barbour and Callender (1981) discussed the question of compliance/non-compliance. They believed that the causes were complicated and maybe a feature of the psychological make-up of the patient and his attitudes.

In 1981 El-Mangoury showed that co-operation was predictable through psychological testing. She found that high need achievers, high need affiliators and those with an internal locus of control, were more likely to co-operate.

Crawfort (1974) had stated that there was a variety of concepts of what constituted co-operation in treatment. There was a difference mainly between those views held by patients and those held by orthodontists. Pope (1953) had shown that behaviour in a given situation varied with the socio-economic level of the individual. In 1980, Slakter, Albino, Fox and Lewis developed a patient co-operation scale which they felt had adequate internal consistency and would be useful in research looking for predictors of co-operation. El-Mangoury (1981) did however, find that co-operation was not a single dimension. The personality factor responsible for co-operation in one area, e.g., oral hygiene, may not be the personality factor responsible for co-operation in another, e.g., care of appliances. White (1977) found however, that in practice, the two were related. He could give no reason for this.

#### SUMMARY.

Methods for measuring a desire or need for treatment include indices which are mainly useful for measures of populations, or individual predictors of behaviour. The latter assumes that a more co-operative patient indicates one desiring treatment. Patient personality appears the most consistent factor affecting behaviour.

THE ADOLESCENT AND HIS BEHAVIOUR:  
THE EFFECT ON TREATMENT.

The adolescent may be regarded as an individual in the age group, 12 - 21 years (Gallagher 1959) or as Feldstein (1959) states "the period extending from puberty to maturity". It is the age group with which the orthodontist has most contact, since it is during these years that an individual reaches a growth rate and dental maturity desirable for most treatment regimens, therefore, it is the age group with which the orthodontist must be most familiar and has been selected for special consideration.

If, as Collins and Harper (1978) state, adolescence is a biosocial phenomenon and the major factors affecting the adjustment of the adolescent include:

- status seeking
- peer acceptance
- sociability
- extroversion
- school achievement
- acceptance of a group centred outlook
- home environment,

the ability of the individual to cope with these would contribute to his self-image and therefore, to his attitudes to orthodontic treatment. Gallagher (1959) states that one of the outstanding traits of the adolescent is his excessive interest in himself, his concern with his body, sex, his seeking of prestige and recognition from contemporaries and a need for activity, strength and aggression. It is a period of establishing identity with his own peer group, assuming adult responsibilities and coming to terms with parental involvement at the same time as desiring comfort and support. These same concepts are expressed by Feldstein (1959), Story (1966), Tjossem (1966).

Rosenberg, Simmons and Rosenberg (1973) found that in the 12 - 13 year age group (early adolescence) there was a heightened self-consciousness, creating an instability of self-image and slightly lower self esteem. They felt that the responsibilities of increased maturity and a changing

environment were responsible for this. Harper and Collins (1973) believe that, although anthropologically adolescence is not viewed as stressful in all societies, stress does occur - not necessarily with biological puberty, but with obligations of adult status. They believe that it arises from an interaction of social pressures which have their root in the culture of which the adolescent is a member. (See Diag. 11).

Feldstein (1959) and others describe adolescence as a constant state of transition. He believes that the ability of the individual to achieve characteristics thought desirable and therefore maintain his self-image, is related largely to his basic personality. This is achieved by a number of overlapping and long standing environmental and genetic factors. Norton and Markowitz (1972) showed the transition in behaviour by describing:

6-9 year olds (pre-pubertal) as curious imitators and easy to treat.

10-13 year olds (early adolescent) as dirty, physical, sports orientated boys and giggly, vain girls. (See Diag. 12).

14-18 year olds (the teenager) - the boys are described as stoic, uncommunicative, conforming to peer pressure and valiantly body and sex conscious. The girls he describes as body, sex, and peer conscious, easier to communicate with and generally more co-operative.

This changing behaviour and attitudes are described similarly by Massler (1962) and Story (1966). They are related mainly to maturity and basic personality and must alter the treatment regimen adopted by the practitioner. Norton and Markowitz (1971), among others, believe that the primary relationship is with the child/adolescent. Parental attitudes are important but only of secondary importance.

Research by Korner and Reider (1955) showed that early treatment (i.e. of 3-6 year olds) was unsuccessful. They believed that children in this age group were too young to understand the significance of treatment. Weiss and Eiser

(1977) believed, however, that patients under twelve years of age were generally more co-operative in the wearing of head gear and other removable appliances but tended to forget appointments and were less punctual. Norton and Markowitz (1971), on the other hand, believed that children in this age group were best treated with fixed appliances but also believed them to be generally quite co-operative. Both researchers believe that the co-operation received from this age group was related to the desire to please, common in this age group. The choice of appliance may have been merely a matter of personal preference.

Maj, Squarzoni Grilli and Belletti (1967) believed that a state of stress exists in most orthodontic patients and that changes in this varied with adjustments to the treatment method and to the appliance. This was contrary to the findings of Burns (1970) who found that patient co-operation was a function of personality, not treatment method. This may mean that anxiety was not a factor affecting co-operation. Lewis and Brown (1973) decided from their findings that the level of anxiety is lower than that reported by Maj et al. (1967).

Norton and Markowitz (1971), Story (1966), Gallagher (1959), Massler (1962), Tjossem (1966), Feldstein (1959), all agree that patient management is best coped with through knowledge of sociometry and psychology of the group with which you are working. They believe that the adolescent must be treated as an adult, given the option for child-like support, when requested by the patient. They all agree that the understanding of individual personality factors is necessary for successful case management. Sims (1972) gives a case history involving an unco-operative adolescent. He continued treatment despite undesirable behaviour and ultimately succeeded. This approach may not have succeeded in other cases if the literature is to be believed. Barbour and Callender (1981) conclude that the orthodontist may not have much effect on personality characteristics of the individual - he may however, take them into account in an effort to change behaviour.



(Diagram 11).

Social pressures which have their root in the culture of which the adolescent is a member.



(Diagram 12).

An early adolescent.

Methods of behaviour modification in orthodontics have been described by Kreit (1968). He refers to "rewarding" of co-operative patients and "punishing" of undesirable behaviour. He believes that, in spite of his efforts, the orthodontist may well fail through no fault of his own. He believes that, if there is a causal relationship between the individual personality and co-operation in treatment, there is little the orthodontist can do to change the patient's personality. Larry White (1974, 1977, 1980) has developed a method of behaviour modification using a technique of modelling, followed by positive and negative reinforcement. He believes, however, that there are still personalities unable to accept treatment methods. Rich (1980) has also developed a method of behaviour modification in the form of self monitoring and reward. The same limitations must still exist. Both White (1980) and Barbour and Callender (1981) believe that the reduction of negative aspects of treatment regimens and optimization of the positive effects will increase the chances of creating a compliant individual. The advertising industry has learnt that "no amount of advertising can overshadow an individual's actual experience". (Mackay 1981A). "Reinforcement of existing patterns of behaviour is always the best goal (in the same sense of the goal most likely to be achieved) for a communication strategy". (Mackay 1981B).

Improved communication techniques considering the characteristics peculiar to the adolescent group (or whatever group the orthodontist is dealing with), must be the major aim of most practitioners in coping with patient behaviour (Lustman 1960). The actual approach will, of course, be variable according to the particular practitioner, and according to the particular patient (which can be seen from the previous literature). Those techniques, e.g., described by Gordon (1970) or Bandler and Grinder (1975, 1979) may be studied and found useful. These techniques and a desire to remain flexible (Lustman 1960) will enable a practitioner to succeed in patient management, it seems. Gold (1975) believes that a knowledge of Gestalt psychology (see Appendix II - Glossary), which deals with the "what" and "how" of behaviour (experimental psychology) is helpful.

He believes this, combined with a knowledge of Rogerian psychology (see Appendix II - Glossary) which concentrates on the "feelings" of the individual and which is used by Gordon (1970), mentioned previously, will aid management of the human personality. He developed a plaque control programme for orthodontic patients, using a chairside assistant as teacher. The patient's co-operation in carrying out instructions was appraised at each visit. When lack of co-operation was evident he utilized the above principles in the form of counselling. He believes, as do many others mentioned previously, that individuals will not co-operate, no matter how thorough a plaque control programme, because of individual personality differences.

This therefore, becomes the area of concentration for this thesis:-

Personality and its effect on  
co-operation in treatment.



(Diagram 13).  
Surely the expression we  
would choose?

PART TWO.

## REASON FOR EXPERIMENTAL WORK.

It is agreed by all that a compliant (co-operative) patient is most desirable. Without co-operation, a faultless treatment plan and technique will still fail.

From the foregoing literature, it can be seen that many overlapping factors affect the attitudes (desire for or against), and consequently, behaviour (co-operation or non co-operation) of the adolescent (in particular) in treatment.

Insight into the psychological factors affecting attitudes, would aid patient management. Greater insight would enable the orthodontist to vary his "technique" of communication and of treatment method depending on the individual personality with which he is dealing.

Literature and research indicates that adolescent conflict between independence and affiliation with parents is a major factor.

Further research in this area appears indicated.

The aim of the following study is to look at the hypotheses that:

- 1) A more autonomous (see Appendix II - Glossary) individual will tend to be less co-operative in treatment.
- 2) A more affiliative (see Appendix II - Glossary) individual will tend to be more co-operative in treatment.
- 3) A less mature individual (i.e. pre-pubertal) will tend to be more affiliative.
- 4) A more mature individual will tend to be more autonomous.

AIM.

To relate the personality variables, autonomy and affiliation of patients currently undergoing orthodontic treatment, with the level of their maturity and their co-operation in treatment.

METHOD.

## PERSONALITY TESTING.

The Edwards Personal Preference Schedule (E.P.P.S.) was selected as the method of measurement, subject to pilot testing. It was thought to be suitable for the following reasons:

- 1) The schedule had been designed by Allen L. Edwards of the University of Washington and a revised addition held by the Psychological Corporation, New York, since 1959, having been widely used since this time. It was designed primarily as an instrument for research and counselling and provides a quick and convenient measure of a number of relatively normal personality variables.
- 2) An attempt is made in the schedule to minimize the influence of social desirability responses.
- 3) Testing is relatively simple. A "Yes" response indicates that the subject believes a statement is characteristic of himself, and a "No" response, that it is not.
- 4) The E.P.P.S. differs from many inventories in that its scores are available for individual factors. For this reason it was possible to delineate particular personality factors, making it possible, as a result, to reduce testing time and simplify results.

Since the test was originally designed for American College students and adults, two pilot studies were thought necessary to establish the fact that it could be administered to Australian schoolage girls.

see ADDENDUM

page 95, E.P.P.S. Validation.

page 96, E.P.P.S. Scoring method.

PILOT STUDY I.  
VOCABULARY TEST.

METHOD.

Subjects: Forty-five year 7 girls were taken from the average, to below average stream of a Metropolitan co-educational High School.

Procedure: Key words were taken from the pertinent statements in the E.P.P.S. and tested. Three alternative meanings, only one of which was correct, were given for each of 17 words. (See Appendix I for details of the test.)

RESULTS.

Summary:

- 1) The majority of words were understood by the majority of the subjects.
- 2) Sixteen words were understood by 50% or more of the subjects.
- 3) One word was understood by less than 50% of the subjects. (See Figs. 1, 2 & 3).

DISCUSSION.

The sixteen words understood by 50% or more of the subjects were thought to be more likely understood in the context of the sentences used in the E.P.P.S.

Twenty-one subjects misunderstood the meaning of "obligation". This was not believed to be significant when used in the context of the sentence from the E.P.P.S. ("I like to avoid responsibilities and obligations").

"Conventional" was understood by less than 50% of subjects. It was paraphrased and as a result - "I like to avoid situations where I am expected to do things in a conventional way" became "I like to avoid situations where I am expected to do things the way they have always been done".

FIG. 1

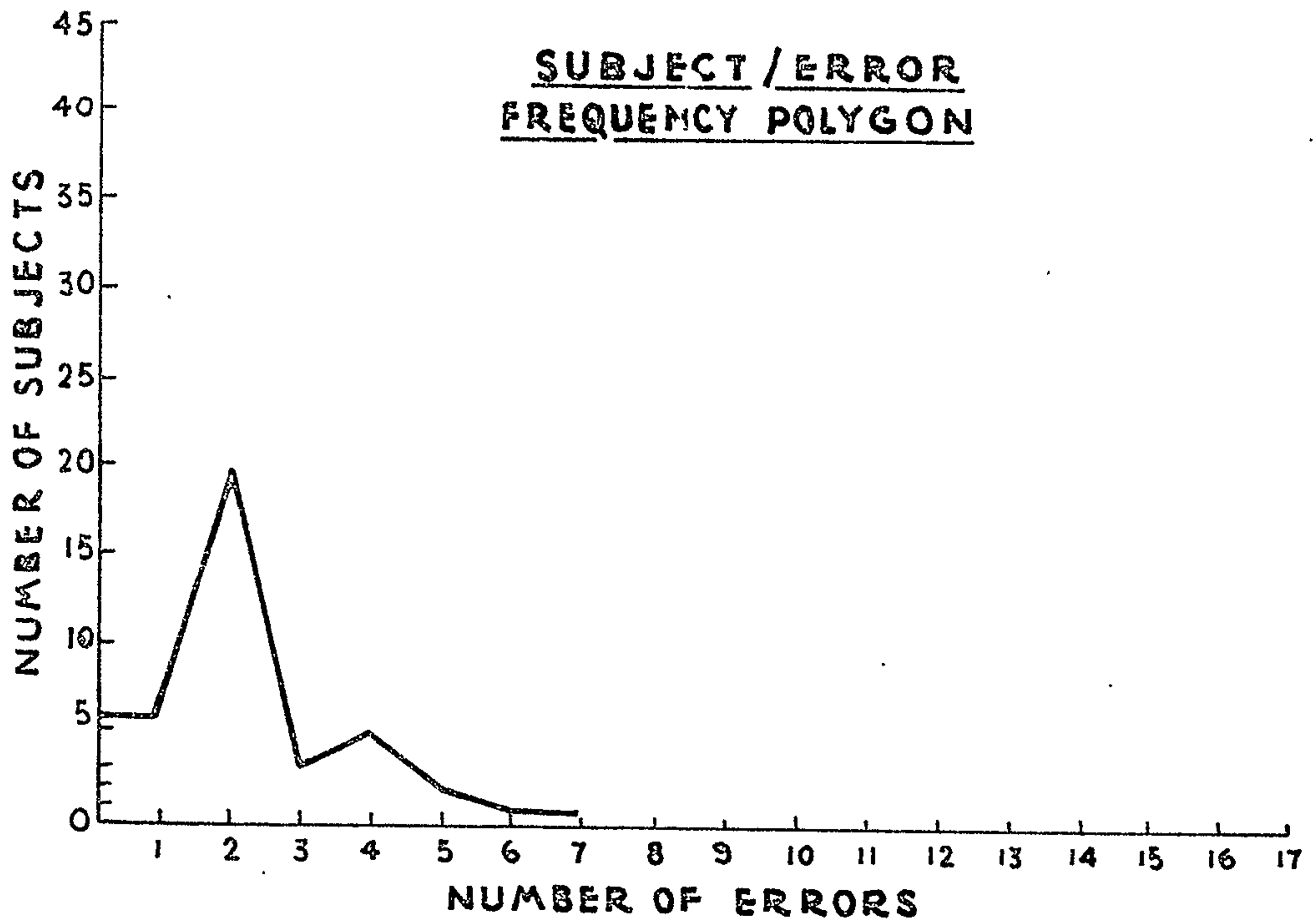


FIG. 2

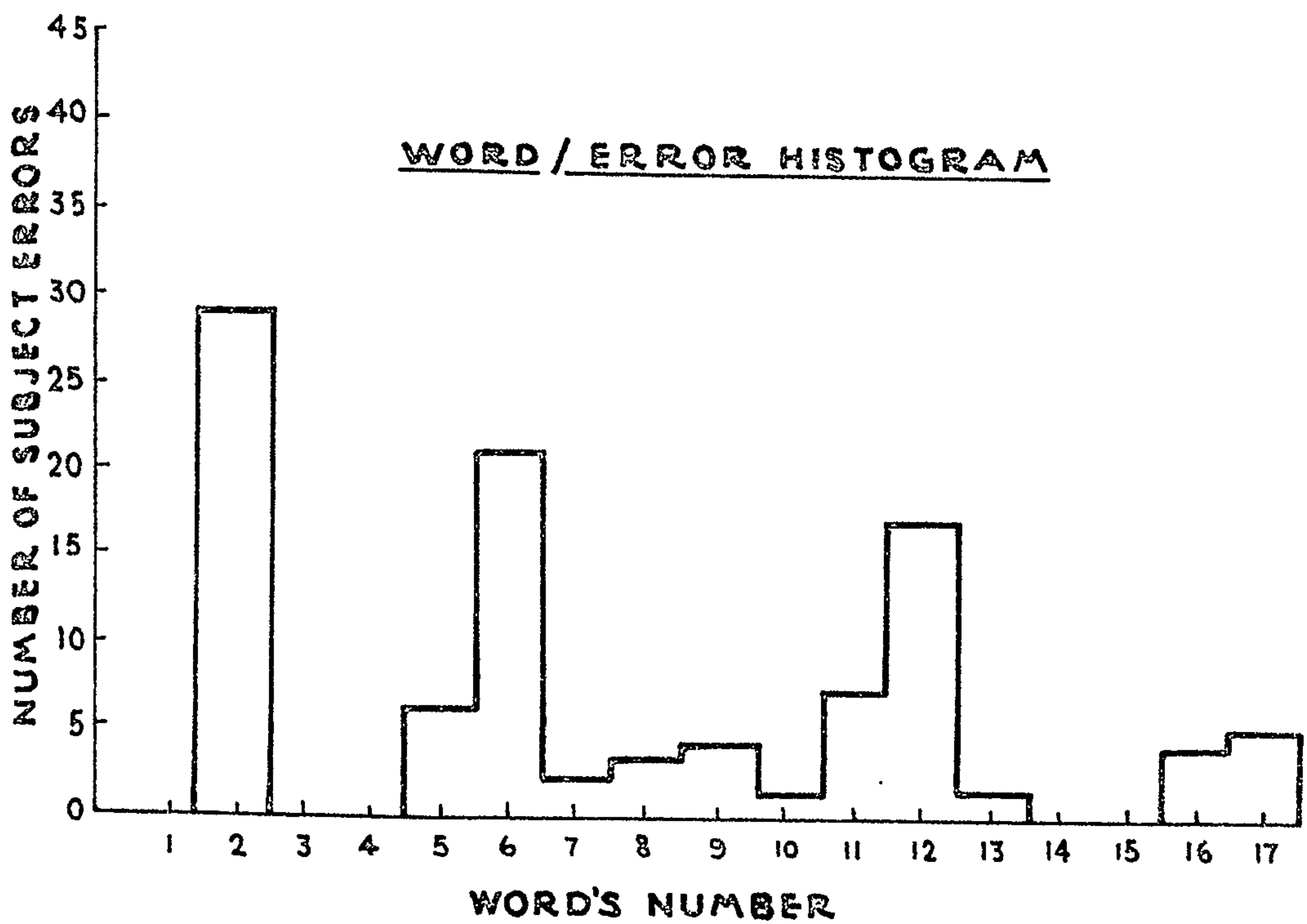
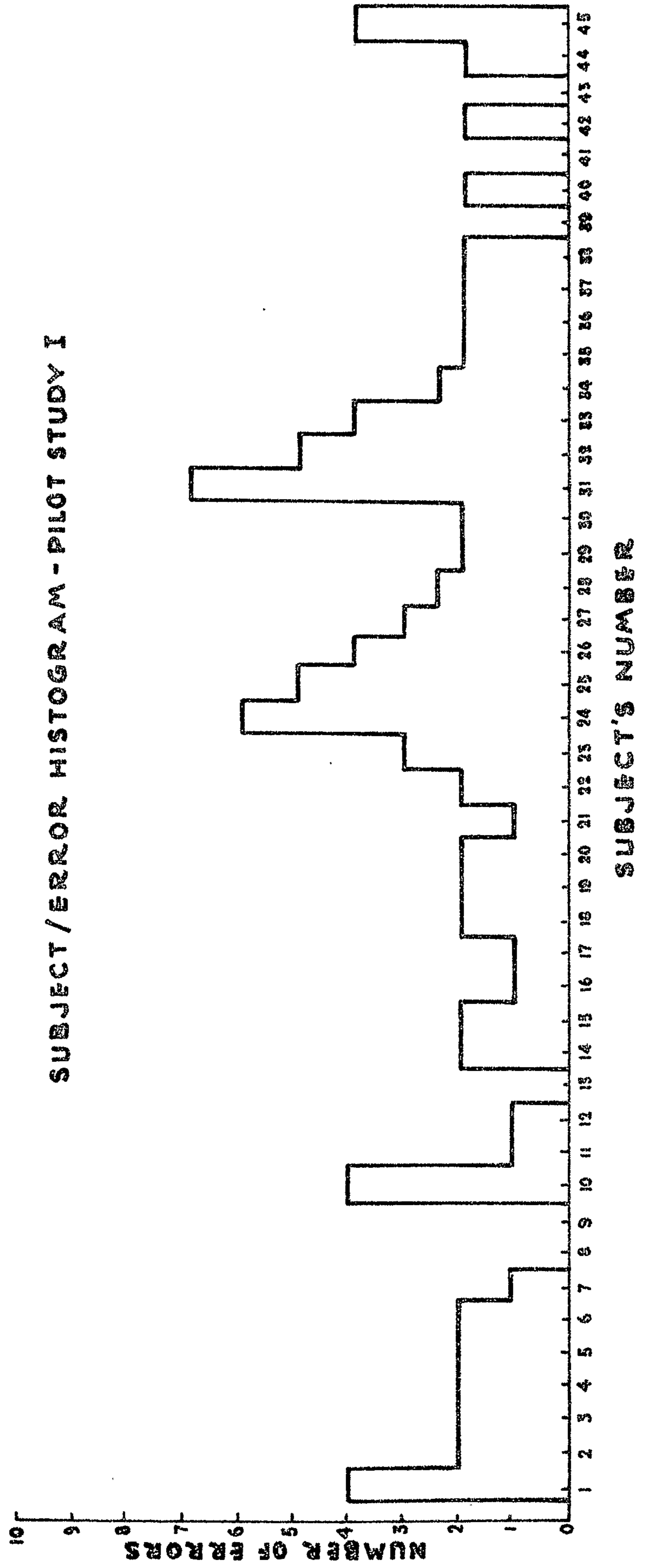


FIG. 3



## PILOT STUDY II.

### TESTING OF THE MODIFIED EDWARDS PERSONAL PREFERENCE SCHEDULE.

(See Appendix I for the Schedule and Answer Sheet used).

#### METHOD.

Subjects: Nine year 7 girls from the average stream of a Metropolitan co-educational High School and judged by their teacher to be of conscientious attitude were chosen.

Procedure: The test was administered in a class room by the students' teacher. The teacher recorded the time taken by each student to complete the test and she recorded any difficulties experienced by subjects.

#### RESULTS.

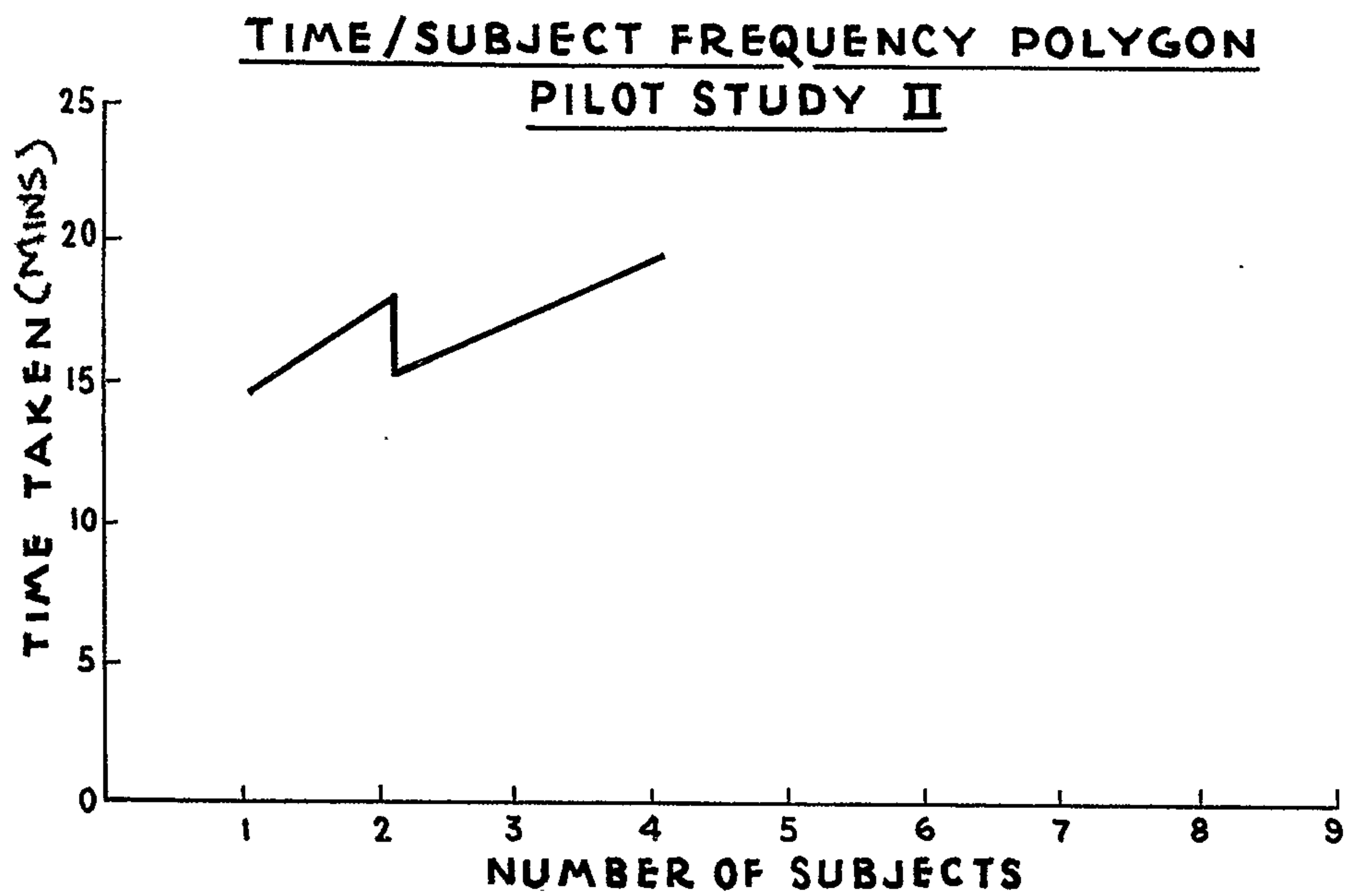
Summary:

- 1) No difficulty in understanding the instructions, or filling out the answer sheet was recorded by the teacher.
- 2) The teacher recorded times between 15 and 20 minutes for completion of the schedule. (See Fig. 4).

#### DISCUSSION.

The schedule was considered suitable for the purposes of the study.

FIG. 4



## MAIN STUDY.

### METHOD.

Subjects: Four hundred and sixty-four female, pre-menarcheal, menarcheal and post menarcheal (see Appendix II - Glossary) patients currently undergoing orthodontic treatment at the United Dental Hospital, Sydney, and in private orthodontic practices in the Sydney Metropolitan area.

Procedure: The schedule was given to the patients to complete either before or after a routine visit. The orthodontist and the nurse completed information at the same visit. Assessment of maturation was by biological means rather than chronological age. This was believed to be more pertinent to the study. (Collins 1982 A). Co-operation was assessed as co-operative and unco-operative, rather than as a scale measurement. It was believed to be sufficiently accurate for the study. (Collins 1982 B). The following instructions were given to all orthodontists and nurses participating in the experiment. (See Appendix I for "Orthodontic Survey", Instructions and Questions and the Answer Sheet).

INSTRUCTIONS FOR NURSES.

- 1) In issuing the schedule, the patient should be told that the University is carrying out a survey to find out how teenagers feel about life.
- 2) The schedule is to be issued to female patients only.
- 3) The schedule is not to be issued to any patient who is:
  - obviously retarded,
  - under 11 years of age,
  - openly resentful or aggressive.
- 4) Issue the booklet and answer sheet at the same time on the patient's arrival.
  - i) Ask her to complete it as quickly as possible either before or after the appointment. She may return the booklet before she goes into the surgery, if she has completed the schedule.
  - ii) Ask her to take it into the surgery with her and give the answer sheet to the dentist.
  - iii) Ask her to bring both with her when she leaves the surgery.
  - iv) Instruct the patient NOT to write on the question booklet.
- 5) Record the following when treatment for the day and the schedule has been completed.

Circle the appropriate classification.

A. Maturation:	Premenarcheal	MAT: PRM
	Menarcheal	M
	Post menarcheal	POM

The patient may be told that we would like to know whether she has finished growing or not. Has she menstruated and, if so, for how long regularly? Regular menstruation for twelve months constitutes post menarche.

B. Parents:	Single at home	P: 1
	Both at home	2

INSTRUCTIONS FOR ORTHODONTISTS.

1) The orthodontist who has had overall management of the patient for most of the treatment should give an overall assessment of the patient as:

Co-operative

or

Unco-operative,

taking into consideration the following factors:

- Co-operation in the punctuality and appointment attendance.
- Co-operation in treatment at the time of the appointment.
- Co-operation in the care and use of any appliances.
- Co-operation in the maintenance of oral hygiene.

Do not deliberate.

Give your initial impression.

Circle the classification you consider the more appropriate:

Co-operative                    C

Unco-operative                UC

2) Record the type of treatment or combination of treatment currently being carried out.

Circle the appropriate:

Appliance:	Full banding	APPL: FB
	Partial banding	PB
	Removable appliance	R
	Headgear	HG

RESULTS.

Of the 464 cases studied 234 (50.4%) were considered to be co-operative and 230 (49.6%) were unco-operative. The means and standard deviations on the variables of affiliation and autonomy are shown in Table 1 below.

TABLE 1.

Means and Standard Deviations for Co-operative and Unco-operative Patients on the Measures of Autonomy and Affiliation.

		<u>Autonomy.</u>	<u>Affiliation.</u>
<u>Co-operative</u>	$\bar{x}$	50.71	44.99
<u>Patients</u>	S	26.26	27.88
<u>Unco-operative</u>	$\bar{x}$	61.06	29.57
<u>Patients</u>	S	25.94	26.87

See Figures 5 and 6 for the frequency of autonomy and affiliation scores.

The Wilk's Lambda (U-Static) and univariate F-ratios (1 and 462 degrees of freedom) indicated significant difference at the 0.0001 level between co-operative and unco-operative patients on both the autonomy and affiliation measures.

The standard canonical discriminant function coefficients were 0.81 for affiliation and -0.57 for autonomy. When a discriminant analysis was performed, the discriminant functions evaluated at the group means showed the group centroids were +0.27 for high affiliation and 0.17 for low autonomy with the co-operative group and -0.28 for the low affiliation and +0.18 for the high autonomy with the unco-operative group.

These results are reflected in the histograms (Figures 7 and 8) below which show considerable overlap between the groups.

Tests of significance of differences showed that co-operative girls scored significantly lower on autonomy ( $t = -4.27$ ,  $df = 462$ ,  $p < 0.001$ ) and significantly higher on affiliation ( $t = 6.07$ ,  $df = 462$ ,  $p < 0.001$ ) than unco-operative girls.

FIG. 6

FREQUENCY POLYGON FOR AFFILIATION SCORES

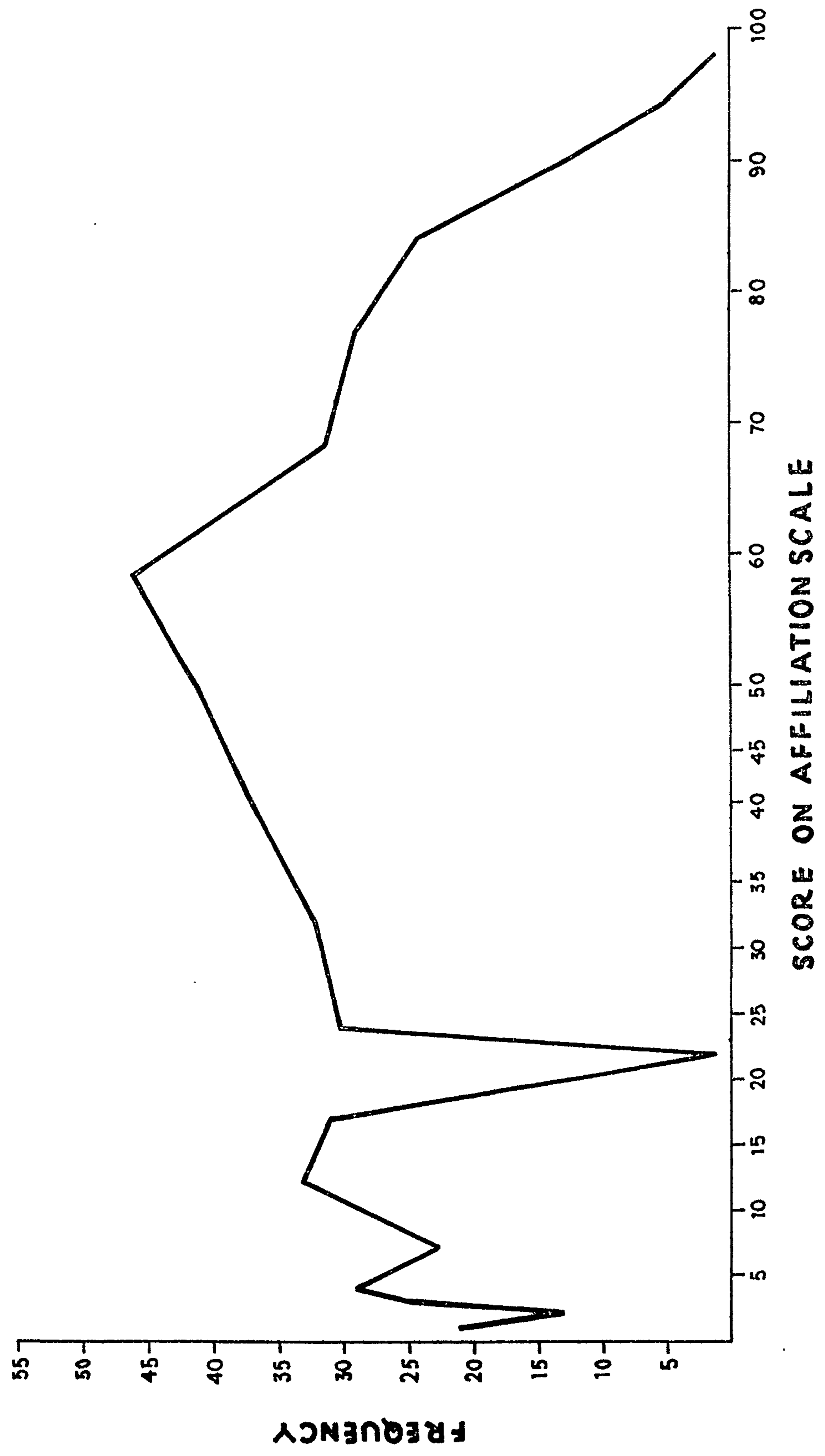


FIG. 5

FREQUENCY POLYGON FOR AUTONOMY SCORES

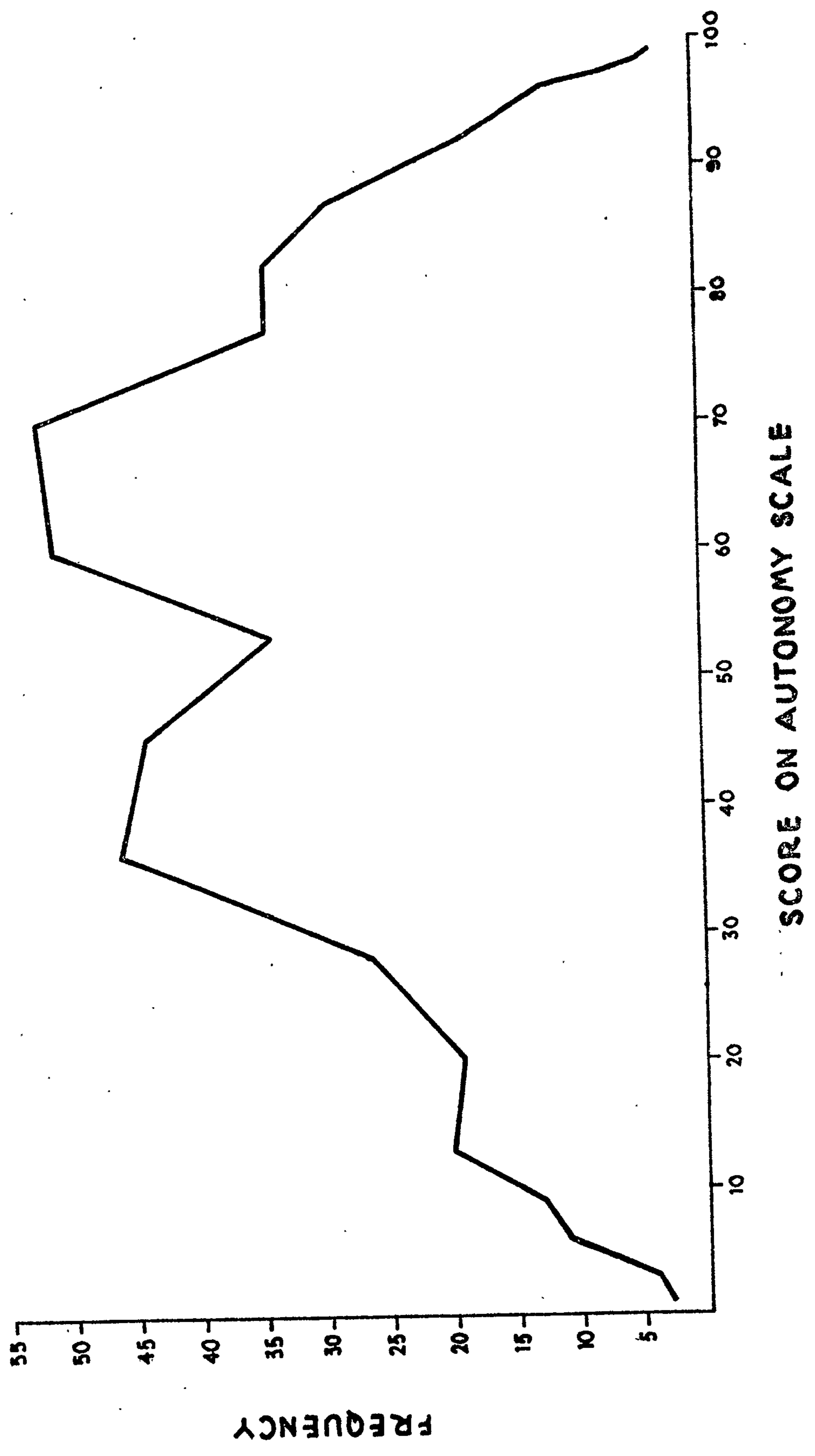


FIG. 7

HISTOGRAM FOR CO-OPERATIVE GROUP  
(CANONICAL DISCRIMINANT FUNCTION)

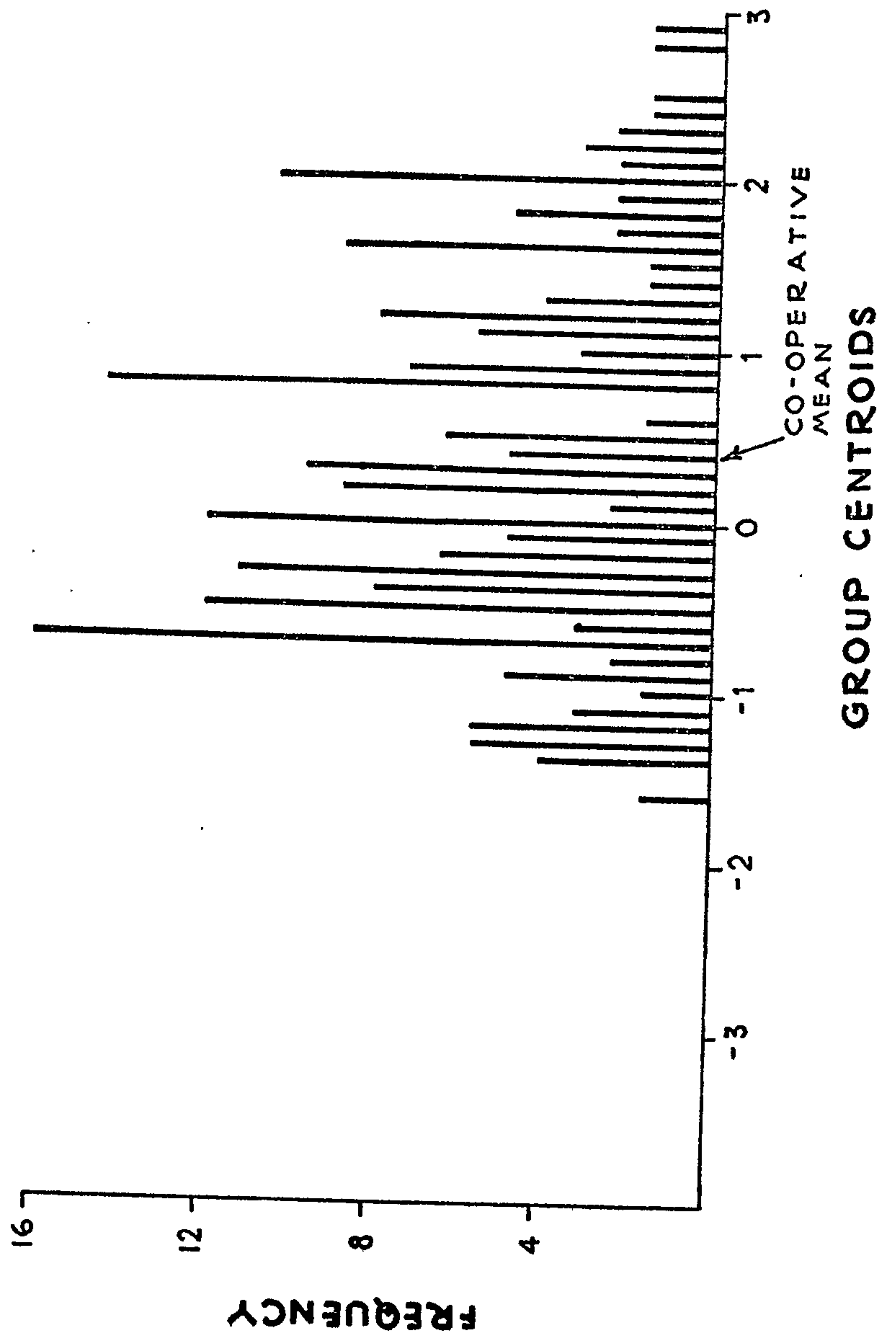
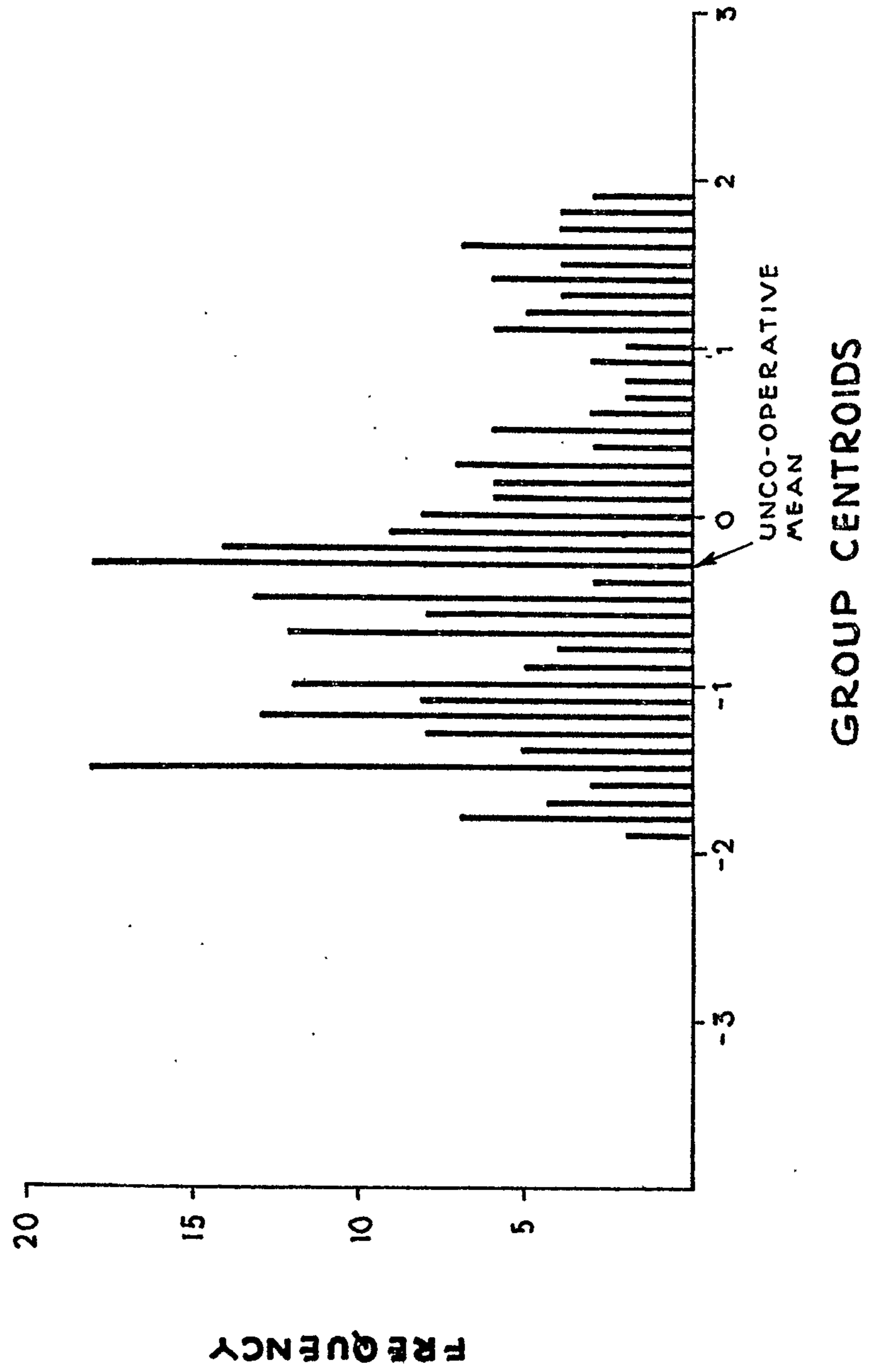


FIG. 8

HISTOGRAM FOR UNCO-OPERATIVE GROUP  
(CANONICAL DISCRIMINANT FUNCTION)



When autonomy was used as a dependent variable and analysed in a 2 x 3 factorial design (two levels of co-operation and three menarcheal ages) a significant main effect was found for co-operation ( $F = 17.68$ ,  $df = 1$ ,  $p < 0.05$ ) and also for menarcheal age ( $F = 9.46$ ,  $df = 2$ ,  $p < 0.05$ ). The interaction effect was not significant ( $F = 0.76$ ,  $df = 2$ ,  $p < 0.47$ ).

The means for each cell on the dimension of autonomy are shown in Table 2 below.

TABLE 2.

Means for Measures of Autonomy for Menarcheal and Co-operation Groups.

	<u>Premenarcheal</u>	<u>Menarcheal</u>	<u>Postmenarcheal</u>
<u>Co-operative</u>	40.09	55.57	54.27
<u>Unco-operative</u>	54.93	64.51	62.03

When affiliation was used as the dependent variable and analysed in a 2 x 3 factorial design (two levels of co-operation and three menarcheal ages) a significant main effect was found for co-operation. ( $F = 39.88$ ,  $df = 1$ ,  $p < 0.05$ ) and also for menarcheal age ( $F = 8.16$ ,  $df = 2$ ,  $p < 0.05$ ). In this case, however, a significant interaction effect was found ( $F = 3.17$ ,  $df = 2$ ,  $p < 0.05$ ). The means for each cell on the dimension of affiliation are shown in the Table 3 below.

TABLE 3.

Means for Measures of Affiliation for Menarcheal and Co-operation Groups.

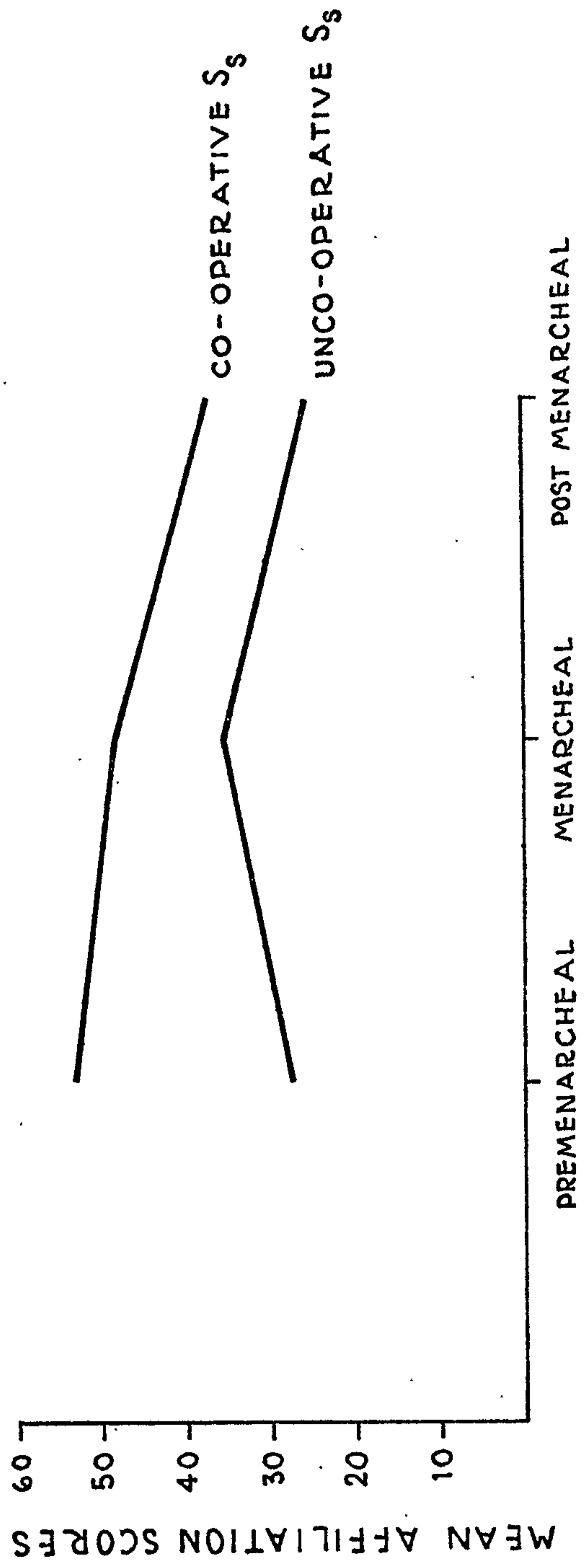
	<u>Premenarcheal</u>	<u>Menarcheal</u>	<u>Postmenarcheal</u>
<u>Co-operative</u>	53.29	48.55	37.14
<u>Unco-operative</u>	27.15	35.85	25.72

The interaction effect is seen in Figure 9.

Tests of significance of differences between menarcheal age groups on the variable of autonomy showed a significant difference between premenarcheal and menarcheal ( $t = 4.15$ ,  $df = 461$ ,  $p < 0.02$ ) and a significant difference between premenarcheal and postmenarcheal ( $t = -3.60$ ,  $df = 461$ ,  $p < 0.02$ ). However, no significant difference was found between menarcheal girls and postmenarcheal girls ( $t = 0.82$ ,  $df = 461$ ,  $p < 0.02$ ).

FIG. 9

RELATIONSHIP BETWEEN MEAN AFFILIATION SCORES AND MENARCHEAL AGE  
FOR CO-OPERATIVE AND UNCO-OPERATIVE GROUPS



Overall  $\alpha$  was set at a level of 0.06 and each contrast was tested at 0.02 level for autonomy. The mean scores and standard deviations for each maturational group are seen in Table 4 below.

TABLE 4.

Mean and Standard Deviations on the Dependent Variable Autonomy when Plotted against Menarcheal Age.

	<u>Mean.</u>	<u>Standard Deviation.</u>
<u>Premenarcheal</u>	47.15	24.27
<u>Menarcheal</u>	60.34	28.02
<u>Postmenarcheal</u>	57.99	25.71

Tests of significant differences between menarcheal age groups on the variable of affiliation showed no significant difference between premenarcheal and menarcheal girls ( $t = -0.27$ ,  $df = 461$ ,  $p = 0.79$ ). However, a significant difference was found between scores of pre and post-menarcheal girls ( $t = 2.84$ ,  $df = 461$ ,  $p < 0.02$ ) and a significant difference was found between menarcheal and post-menarcheal girls ( $t = 3.29$ ,  $df = 461$ ,  $p < 0.02$ ).

Overall  $\alpha$  was set at a level of 0.06 and each contrast was tested at 0.02 level for affiliation also. The means and standard deviations are seen in Table 5 below.

TABLE 5.

Mean and Standard Deviations on the Dependent Variable Affiliation when Plotted against Menarcheal Age.

	<u>Mean.</u>	<u>Standard Deviation.</u>
<u>Premenarcheal</u>	40.84	31.59
<u>Menarcheal</u>	41.77	27.73
<u>Postmenarcheal</u>	31.67	25.86

DISCUSSION.

Since almost 50% (49.6%) of the subjects studied were unco-operative, it could be suggested that a significant proportion of those undergoing treatment at the present time, in the Sydney Metropolitan area, are either psychologically unsuitable subjects for orthodontic treatment, wrongly motivated or incorrectly managed.

It could be argued that the patients were viewed in a super critical way for the purposes of the study and that this may have given an erroneous impression. Considering the sample size (464), it is believed this effect would be minor.

The fact that the mean affiliation scores were significantly lower for unco-operative patients and higher for co-operative patients and that the mean autonomy scores were significantly higher for unco-operative patients and lower for co-operative patients, is of interest. It suggests a definite relationship between these personality factors and co-operation and in the direction which was hypothesised. El-Mangoury (1981) had also shown that personality factors were indicators of co-operation.

Statistical analysis showed that there was a range of scores for both personality factors for both groups (co-operative and unco-operative) and that there was considerable overlap between the groups. The range for affiliation did, however, indicate higher scores for the co-operative group and lower scores for the unco-operative group. The reverse was found true for the scores for autonomy. This agreed with the findings of El-Mangoury (1981), who also found "high-need affiliators co-operate better orthodontically than low-need affiliators".

This confirmed, statistically, the null hypotheses (1) and (2). It may be explained in terms of the fact that the peer group influence and parental influence on high affiliation scorers both have a positive effect. This could be due to the fact that the wide application of orthodontics in the Sydney Metropolitan area (from which the subjects were taken) has made orthodontics acceptable to the peer group and parents in the groups studied. This has resulted in co-operative behaviour.

It seems that, when autonomy scores reach a particular level for an individual, it becomes a significant factor. Parental wishes (in this case orthodontic treatment) and peer group influence come into conflict with the desire for independence. These are some of the conflicts referred to by Collins and Harper (1973) and others (Feldstein 1959, Story 1966, Tjossem 1966).

The patient ceases to be co-operative when the desire for independence (autonomy) assumes supremacy over the desire to be influenced by the peer group or parental wishes (affiliation).

When affiliation and autonomy were taken as dependent variables, analysis showed that a significant relationship existed, not only with co-operation but with menarcheal age.

Both co-operative and unco-operative groups showed a decrease in affiliation with maturational age in a similar way, following menarche. This may indicate a gradual decrease in affiliation, independent of other factors, particularly once puberty is reached.

Co-operative and unco-operative groups showed an overall increase in autonomy with maturational age.

Investigation showed that, for autonomy, there was a significant difference in the mean scores between premenarche and menarche. The difference from menarche to postmenarche was not significant. This suggests that the personality factor autonomy increases rapidly at puberty and continues at this high level thereafter.

These findings agree with the work of many researchers who believe that the increased need for independence is the major factor affecting behaviour in adolescence (Story 1966, Tjossem 1966, Norton & Markowitz 1977).

Affiliation scores, however, showed no significant change from premenarcheal age to menarcheal age. A significant decrease could be seen between the mean scores of premenarcheal and postmenarcheal ages and between menarcheal and postmenarcheal ages. This may indicate that, until puberty, there is a continued need in both groups for peer and parental approval despite the conflicting and increasing need for

independence. This is discussed by Kreit, Burston and Delman (1968) and it is believed that these conflicts affect the behaviour (co-operation or non co-operation) of the individual.

From the results it can be seen that the personality affects behaviour (co-operation and non co-operation) and that different maturational age groups have different personality traits. From this it could be deducted that different maturational age groups tend to behave differently. This would agree with the findings of Colenaty and Gabriel (1977) and Collins and Thomas (1970) and others.

It seems therefore, from the results of this study, that personality factors (in particular, autonomy and affiliation) and age (i.e., maturational age) must be taken into account in the prediction of possible co-operation from a patient and therefore, an assessment of his desire for treatment. It may affect a clinician's decision on the wisdom and need for orthodontic treatment.

Since results show a greater likelihood of co-operation in the premenarcheal girls, it could be argued that early treatment is desirable.

Since early treatment is not always possible, it could be stated that in some cases, e.g. unmotivated high scoring autonomous personalities, treatment should not be started if the malocclusion is such that the final result, functionally and aesthetically, is only a marginal improvement.

If the malocclusion is such that the treatment is strongly clinically indicated, the personality characteristics of the individual should be taken into consideration when planning the treatment regimen. It may mean the difference between using a removable appliance (an activator or Fränkel) and a fixed appliance (the Herbst appliance). It may mean short term treatment, giving a result less than the orthodontist would like or it may mean careful counselling.

The major problem envisaged, is the recognition of these personality factors and the ability to decide on the best method of approach.

The personality test used in this study was short and uncomplicated and easily scored, compared with other personality tests in current usage. It took at least ten minutes of the patient's time, required supervision and additional time for scoring and evaluation. The greatest problem in administration was incorporation of the test into a clinical situation. This was not a major problem in the University Clinic situation where time was not so vital, but in private clinics, where patients were seen at a more rapid rate and hence, expected appointments of a minimum duration, it becomes more difficult to administer.

Time and its value are two major factors in private orthodontic clinics. No private clinic (to the writer's knowledge) is equipped with a trained psychologist for personality assessment and counselling. Parents may not appreciate the additional expense and patients, the additional time, if referred to a clinical psychologist for assessment.

Very few clinical orthodontists are equipped with extensive communication techniques.

"What works with one patient, does not work with another" (Lustman 1960).

Norton and Markowitz (1971) give a number of suggestions as to how adolescent behaviour may be coped with in the average clinical situation. They believe that understanding the basic differences in age groups must aid establishment of rapport with patients.

The writer concludes from results that, although this is important and would probably aid management of the majority, additional techniques are required for those outside the majority. Additional study by the orthodontist, in communication techniques described by Gordon (1970) or Bandler and Grinder (1975, 1979) must aid recognition of personality problems and may improve attitudes before complicated treatment regimens are commenced.

El-Mangoury (1981) believes that different factors are responsible for different facets of co-operation. Further research in this area appears indicated. She states also that she is "currently developing a more concise and precise standardized psychological test to predict orthodontic co-operation". This would be of interest to researchers in this field.

### SUMMARY.

The results of this experiment support the hypotheses:

- 1) A more autonomous individual will tend to be less co-operative in treatment.
- 2) A more affiliative individual will tend to be more co-operative in treatment.
- 3) A less mature individual (i.e., pre-pubertal) will tend to be more affiliative.
- 4) A more mature individual will tend to be more autonomous.

From the findings, it may also be suggested that girls of premenarcheal age are more likely to be more co-operative than girls of menarcheal or postmenarcheal age.

CONCLUSION.

The area involving co-operation in orthodontics is believed to be one of significance. This is felt because of personal clinical experience and experiences reported by others regarding the problems which ensue. In addition, the number of patients in this study, judged as unco-operative, is significant.

From the results of the experiment, the following recommendations are made:

- 1) Establishment of personality type prior to treatment is desirable (albeit under present conditions this may not be practical).
- 2) Development of communication skills by orthodontists or their auxiliaries, which enable maximum rapport with the full range of personalities encountered.
- 3) Cancellation of treatment in some cases where unfavourable patient attitudes are believed unmodifiable.

Because this subject is so basic to the clinical practice of orthodontics, it is believed further research is indicated in this field.

It is also maintained the areas in need of further development are as follows:

- 1) Whether those with the highest autonomy scores produce the most unco-operative patients.
- 2) What personality factors control the different facets of co-operation.
- 3) What changes in co-operation take place with different treatment approaches and different personalities.
- 4) Whether girls judged to be unco-operative at puberty become increasingly co-operative in late adolescence or early adulthood.
- 5) Whether there are significant differences in co-operation with boys in the same maturational age groups as girls.
- 6) Whether there is a significant difference in co-operation between United Dental Hospital patients and patients from private practices.

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APPENDIX I.

WORD MEANING SURVEY

There is ONE correct meaning for each word listed.

Make sure ALL questions are answered.

Please think very carefully and answer quickly by drawing a circle around the letter ( a, b, c ) next to the meaning which you think is correct.

---

1. SITUATION            a    A place to eat when visiting a foreign country,  
                              b    Something to wear in cold weather,  
                              c    A place or circumstance in which you could find yourself.
  
2. CONVENTIONAL       a    The change of one thing into another,  
                              b    To do things the way they have always been done,  
                              c    A place where they hold business meetings.
  
3. INDEPENDENT        a    To be able to do things by yourself without help or  
    permission from others,  
                              b    To have a problem that cannot be solved,  
                              c    To have no like or dislike for somebody.
  
4. CRITICISE            a    To place importance on something to show special  
    significance,  
                              b    To talk about somebody by finding fault with them,  
                              c    To shout in triumph after having won some contest.
  
5. RESPONSIBLE        a    To answer an adult cheerfully and politely,  
                              b    To act the right way without the presence of a parent  
    or teacher,  
                              c    To act in a quick but careful way.
  
6. OBLIGATION         a    To do something you are ordered to do,  
                              b    To do something you have promised to do,  
                              c    To do something you wanted to do.
  
7. OBSERVE             a    Something that is clearly open to the eye or mind,  
                              b    To block out the view of something,  
                              c    To watch or take notice of a person or thing.
  
8. INDIVIDUAL          a    A single human being,  
                              b    Something so small that it cannot be divided into  
    something smaller.  
                              c    Somebody whose word cannot be believed .

9. SYMPATHISE
- a The feeling a person gets when listening to a symphony orchestra,
  - b To have two different things occur at the<sup>same</sup> time,
  - c To share and have the same feeling or opinion as another person.
10. DEPRESSED
- a To feel sad and unhappy with yourself and the world,
  - b To feel relaxed and calm,
  - c To feel very happy.
11. DISPUTE
- a A group of people enjoying themselves,
  - b Heated difference of opinion,
  - c Things so unlike that there is no way to compare them.
12. ARGUMENT
- a To be able to get on with one another,
  - b To mix two different opinions to get a final answer,
  - c A reason given for or against a subject being discussed.
13. AUTHORITY
- a To find out and prove the truth of something,
  - b A person who writes the story of his own life,
  - c Persons having the power to make you do what they want you to do.
14. DISTRACTED
- a Having your attention drawn away from the task being done,
  - b To point out the difference between two things,
  - c To have no confidence in or to doubt somebody.
15. PARTICIPATE
- a To discuss something before it happens,
  - b To take part in an activity in the company of others,
  - c To pay no attention to or ignore somebody.
16. ANALYSE
- a To be in harmony with your surroundings,
  - b To put to sleep with gas for an operation,
  - c To examine in detail the parts of something being investigated.
17. MOTIVES
- a Something that causes a person to act,
  - b The feathers that birds lose when changing plumage,
  - c Words that are written on your school crest.

THANK YOU FOR YOUR COOPERATION.

## ORTHODONTIC SURVEY

This survey consists of a number of pairs of statements about things that you may or may not like, or about ways in which you may or may not feel.

Look at the example below

A. I like to talk about myself to others.

B. I like to work towards some goal I have set for myself.

Which of these statements is more characteristic of what you like?

If you think statement A. is more like you, then you choose A.

If you think B. is more like you, then choose B.

If both describe how you feel or what you like, then you choose the one which you consider is the more like you.

Similarly, if neither statement describes how you feel or what you like, then you choose the one which you consider would be more like you.

Your choice should indicate how you feel or what you like at this moment - NOT how you think you SHOULD feel.

This is NOT a test.

There are NO right or wrong answers.

Make a choice for EVERY pair of statements, do not leave any unanswered.

On the separate answer sheets are numbers corresponding to the numbers of the pairs of statements.

Check to make sure you are marking the SAME item number as the item you are reading in the booklet.

For each number on the answer sheet very carefully draw a circle around the A or B to indicate the statement you have chosen.

Your FIRST and IMMEDIATE choice should be the answer you circle.

ORTHODONTIC SURVEY QUESTIONNAIRE.

1. A. I like to be able to come and go as I want to.  
B. I like to be able to say I have done a difficult job well.
2. A. I like to avoid situations where I am expected to do things the way they have always been done.  
B. I like to read about the lives of great men and women.
3. A. I like to be independent of others in deciding what I want to do.  
B. I like to keep my things neat and orderly on my desk or workspace.
4. A. I like to criticize people who are in a position of authority.  
B. I like to use words which other people often do not know the meaning of.
5. A. I like to accomplish tasks that others recognise as requiring skill and effort.  
B. I like to come and go as I want to.
6. A. I like to praise someone I admire.  
B. I like to feel free to do as I want to do.
7. A. I like to keep my letters, bills and other papers neatly arranged and filed according to some system.  
B. I like to be independent of others in deciding what I want to do.
8. A. I like to ask questions which I know no one will be able to answer.  
B. I like to criticize people who are in a position of authority.
9. A. I get so angry that I feel like throwing and breaking things.  
B. I like to avoid responsibilities and obligations.
10. A. I like to be successful in things undertaken.  
B. I like to form new friendships.

11. A. I like to follow instructions and do what is expected of me.  
B. I like to have strong attachments with my friends.
12. A. Any written work that I do I like to have precise, neat, and well organised.  
B. I like to make as many friends as I can.
13. A. I like to tell amusing stories and jokes at parties.  
B. I like to write letters to my friends.
14. A. I like to be able to come and go as I want to.  
B. I like to share things with my friends.
15. A. I like to feel free to do what I want to do.  
B. I like to observe how another individual feels in a given situation.
16. A. I like to avoid situations where I am expected to do things the way they have always been done.  
B. I like my friends to sympathize with me and cheer me up when I am depressed.
17. A. I like to avoid responsibilities and obligations.  
B. I like to be called upon to settle arguments and disputes between others.
18. A. I like to criticize people who are in a position of authority.  
B. I feel timid in the presence of other people I regard as my superiors.
19. A. I like to say what I think about things.  
B. I like to forgive my friends who may sometimes hurt me.
20. A. I like to be independent of others in deciding what I want to do.  
B. I like to do new and different things.
21. A. I like to do things that other people regard as not the way they have always been done.  
B. I like to put in long hours of work without being distracted.

22. A. I like to do things in my own way and without regard to what others may think.  
B. I like to read books and plays in which sex plays a major part.
23. A. I like to avoid responsibilities and obligations.  
B. I like making fun of people who do things I regard as stupid.
24. A. I like to be loyal to my friends.  
B. I like to do my very best at whatever I undertake.
25. A. I like to do things for my friends.  
B. When planning something, I like to get suggestions from other people whose opinion I respect.
26. A. I like to share things with my friends.  
B. I like to make a plan before starting to do something difficult.
27. A. I like to have strong attachments with my friends.  
B. I like to say things that are regarded as witty and clever by other people.
28. A. I like to do things with my friends rather than by myself.  
B. I like to say what I think about things.
29. A. I like to study and analyze the behaviour of others.  
B. I like to do things that other people regard as not the way they have always been done.
30. A. I like my friends to feel sorry for me when I am sick.  
B. I like to avoid situations where I am expected to do things the way they have always been done.
31. A. I like to supervise and direct the actions of other people whenever I can.  
B. I like to do things in my own way without regard to what others may think.
32. A. I feel that I am inferior to others in most respects.  
B. I like to avoid responsibilities and obligations.

33. A. I like to be successful in things undertaken.  
B. I like to form new friendships.
34. A. I like to analyze my own motives and feelings.  
B. I like to make as many friends as I can.
35. A. I like my friends to help me when I am in trouble.  
B. I like to do things for my friends.
36. A. I like to argue my point of view when it is attacked  
by others.  
B. I like to write letters to my friends.
37. A. I feel guilty whenever I have done something I know is  
wrong.  
B. I like to have strong attachments with my friends.
38. A. I like to share things with my friends.  
B. I like to analyze my own motives and feelings.
39. A. I like to form new friendships.  
B. I like my friends to help me when I am in trouble.
40. A. I like to do things with my friends rather than by myself.  
B. I like to argue for my point of view when it is attacked  
by others.
41. A. I like to participate in groups in which the members  
have warm and friendly feelings toward one another.  
B. I feel guilty whenever I have done something I know is  
wrong.
42. A. I like to participate in groups in which the members  
have warm and friendly feelings to one another.  
B. I like to help my friends when they are in trouble.
43. A. I like to do things with my friends rather than by myself.  
B. I like to experiment and try new things.

44. A. I like to do things for my friends.  
B. When I have some assignments to do, I like to start in and keep working on it until it is completed.
45. A. I like to be loyal to my friends.  
B. I like to go out with attractive persons of the opposite sex.
46. A. I like to write letters to my friends.  
B. I like to read newspaper accounts of murders and other forms of violence.
47. A. I like to sympathize with my friends when they are hurt or sick.  
B. I like to say what I think about things.
48. A. I like to eat in new and strange restaurants.  
B. I like to do things that other people regard as not the way they have always been done.
49. A. I like to complete a single job or task at a time before taking on others.  
B. I like to feel free to do what I want to do.
50. A. I like to participate in discussions about sex and sexual activities.  
B. I like to do things in my own way without regard to what others may think.
51. A. I get so angry that I feel like throwing and breaking things.  
B. I like to avoid responsibilities and obligations.
52. A. I like to help my friends when they are in trouble.  
B. I like to be loyal to my friends.
53. A. I like to do new and different things.  
B. I like to form new friendships.
54. A. When I have some assignment to do, I like to start in and keep working on it until it is completed.  
B. I like to participate in groups in which the members have warm and friendly feelings toward one another.

55. A. I like to go out with attractive persons of the opposite sex.  
B. I like to make as many friends as I can.
56. A. I like to be generous with my friends.  
B. I like to observe how another individual feels in a given situation.
-

ANSWER  
SHEET

NAME: \_\_\_\_\_  
AGE: \_\_\_\_\_ yrs. \_\_\_\_\_ months

- 5<sup>A</sup> 10<sup>A</sup>
- 6<sup>A</sup> 11<sup>A</sup>
- 7<sup>A</sup> 12<sup>A</sup>
- 8<sup>A</sup> 13<sup>A</sup>
- 9<sup>A</sup> 14<sup>A</sup> 15<sup>A</sup> 16<sup>A</sup> 17<sup>A</sup> 18<sup>A</sup> 19<sup>A</sup> 20<sup>A</sup> 21<sup>A</sup> 22<sup>A</sup> 23<sup>A</sup>
- 10<sup>A</sup> 24<sup>A</sup> 25<sup>A</sup> 26<sup>A</sup> 27<sup>A</sup> 28<sup>A</sup> 33<sup>A</sup> 38<sup>A</sup> 39<sup>A</sup> 40<sup>A</sup> 41<sup>A</sup> 42<sup>A</sup> 43<sup>A</sup> 44<sup>A</sup> 45<sup>A</sup> 46<sup>A</sup>
- 11<sup>A</sup> 29<sup>A</sup> 34<sup>A</sup>
- 12<sup>A</sup> 30<sup>A</sup> 35<sup>A</sup>
- 13<sup>A</sup> 31<sup>A</sup> 36<sup>A</sup>
- 14<sup>A</sup> 32<sup>A</sup> 37<sup>A</sup>
- 15<sup>A</sup> 47<sup>A</sup> 52<sup>A</sup>
- 16<sup>A</sup> 48<sup>A</sup> 53<sup>A</sup>
- 17<sup>A</sup> 49<sup>A</sup> 54<sup>A</sup>
- 18<sup>A</sup> 50<sup>A</sup> 55<sup>A</sup>
- 19<sup>A</sup> 51<sup>A</sup> 56<sup>A</sup>

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	R	C	S
AUT			
AFF			

MAT: PRM  
M  
POM

P: 1 2

APPL: FB  
PB  
R  
HG

C: C VC

APPENDIX II.

GLOSSARY.

## GLOSSARY OF TERMS.

Autonomy. (E.P.P.S. Handbook 1959, P.11).

To be able to come and go as desired, to say what one thinks about things, to be independent of others in making decisions, to feel free to do what one wants to do, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what others may think, to criticize those in a position of authority, to avoid responsibilities and obligations.

Affiliation. (E.P.P.S. Handbook 1959, P.11).

To be loyal to friends, to participate in friendly groups, to do things for friends, to form new friendships. to make as many friends as possible, to share things with friends, to do things with friends rather than alone, to form strong attachments, to write letters to friends.

Menarche. (Hoerr and Osol 1960).

The time when menstruation starts, hence:

pre-menarcheal,  
menarcheal and  
post menarcheal.

Saliency. (Cohen 1970)

The extent to which a particular pattern stands out as a factor determining the observer's impression of another person.

Oral Aggressive. (English and English 1958)

Psychoanalytic term, aggressive, envious, ambitious, exploiting of others.

Oral Passive. (English and English 1958)

Requires support from others, passive, gratified by others.

Gestalt Psychology. (Munn: P.161A).

Developed by Wertheimer with Koffka and Kuhler in 1912 as psychological principles involving the whole person or the whole situation in which he adjusts (holistic). Those who follow may be termed configurationalists. This has had a marked

impact on the conception of how behaviour develops and even of how the brain functions. This frequently involves psychoanalysis (Freud was one of these).

Rogerian Psychology. (Munn 1961B).

Developed by Rogers in the early 1940's as a substitute for psychoanalysis. It is known as "client-centred" therapy and usually requires much less time than psychoanalysis. It is called "non-directive". The client, rather than the counsellor, plays the central role in achieving a solution.

Body Image. (Kiyak, West, Hohl and McNeil 1982).

An individual's self-concept of his or her physical being.

Self Esteem. (Kiyak, West, Hohl and McNeil 1982).

An individual's self assessment of his worth as a social, physical and personal being.

ADDENDUM

## EDWARDS PERSONAL PREFERENCE SCHEDULE VALIDATION

The Edwards Personal Preference Schedule (E.P.P.S.) has been tested by a number of researchers as to the validity, stability and hence reproducibility of its results:

(Bernadin and Jessor, 1957,  
Gisvold 1958,  
Goodstein and Heilbrun, 1959,  
Klett, 1957,  
Zuckerman, 1958.)

It was found to be both reliable and reproducible in its testing of the fifteen characteristics listed in the Schedule.

For the purposes of this study, only two characteristics were tested and for this reason the testing and the scoring were modified accordingly. Zuckerman (1958) and Gisvold (1958) have shown that the E.P.P.S. is valid when used for testing of only two of the personality factors.

## E.P.P.S. SCORING METHOD

A method of hand scoring was adopted for the modified Edwards Personal Preference Schedule.

The answer sheet used was as designed in the original schedule. Only the question numbers were changed. The numbers pertinent to the Affiliation and Autonomy questions only were used and the numbers were changed so that 5 in the original became 1, and 10 became 2, and so on. This allowed the original method of scoring as outlined in the E.P.P.S. handbook, to be applied.

- METHOD:
1. Using the template provided, questions 25 and 101 were to be deleted. This meant that in the revised form, responses 9 and 33 were deleted.
  2. The number of " A's " encircled in both rows (horizontal) of answers on the sheet were counted and recorded at the end of the row in column " r ". The " A's " of questions 9 and 33 were not counted.
  3. The " B's " encircled in both columns (vertical) were counted and these were recorded in column " c " (starting at the top). The " B's " of questions 9 and 33 were not counted.
  4. The two numbers in each row ( AUT and AFF ) of columns " r " and " c " were then added and these were recorded in column " s ". These were the row score totals for the two personality variables tested.
  5. These scores were then converted to a percentile measurement using the table of scores given in the E.P.P.S. handbook. These had been based on normal values for women college students. (N=749)

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