

THE EFFECTS OF THE CONCENTRATION OF
THE POPULATION AND THE CONSEQUENCES
OF THE CONCENTRATION OF THE
POPULATION

THE EFFECTS OF THE COMBINATION OF
TRIFLUOPERAZINE AND AMYLOBARBITONE
ON ADULT STUTTERERS

A THESIS
SUBMITTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Presented to the
UNIVERSITY OF THE WITWATERSRAND,
JOHANNESBURG

by

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MAY 1964

DECLARATION BY CANDIDATE

I HEREBY DECLARE THAT -

- (1) This thesis is my own work.
- (2) This work has not been incorporated in a thesis submitted for a Master's or Doctor's Degree in the University of the Witwatersrand, or in any other University.

Lipelle Simon

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SUMMARY OF DISSERTATION

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SUMMARY

The aim of this study was to ascertain the effects of a combined mixture of Trifluoperazine and Amylobarbitone (Amylozine) on adult European and African stutterers. The hypothesis underlying this study was that a reduction in general anxiety brought about by the drug would cause a reduction in the severity and frequency of stuttering.

A perspective of the literature on anxiety, stuttering and related aspects was presented. Generally it appears that anxiety can be described as anticipatory behaviour due to apprehension of previously-feared experiences. Contradictory results obtained from previous studies on the measurements of anxiety were thought to be due to a lack of agreement in establishing and accepting a criterion of what constitutes anxiety. The relevance to anxiety in stuttering is based mostly on clinical impressions. The terms "anticipation" and "avoidance" of stuttering, as referred to in the literature, presupposes the presence of learned anxiety and fear brought about by the stutterer's attitude towards poor speech performances. The nature of anxiety and stuttering among urbanized Africans and their reaction to drug therapy appears to be similar to that observed among Europeans.

An attempt was made to execute a design that would, to some extent, eliminate some of the apparent limitations present in previous studies on drug therapy with stutterers. The study extended over five three-weekly periods. Subjects received either the drug or placebo during the second and fourth periods of the study, and the first, third and fifth periods constituted the non-medicated periods. The double-blind technique was used. Forty-six subjects (47 Europeans and 9 Africans) were randomly allocated the drug or placebo in the second period, and these allocations were switched for the fourth period. Measurements concerning eleven factors associated with stuttering behaviour were taken once in three weeks. These measurements included severity

/ratings ...

ratings, frequency counts of the moments of stuttering, reading rate, an anxiety measure and subjects' self-ratings. A schedule was constructed which contained questions on stuttering and which was completed daily by each subject. The subjects' evaluations of their response to the drug and placebo formed the verbatim material of the study.

Apart from the effects of the drug on stuttering, the outcome of various statistical procedures resulted in subsidiary conclusions being drawn about facets of the measurements of stuttering, which are:

- ✓ 1. That a single investigator can make reliable ratings of the severity of stuttering. High correlations were found between the ratings of five judges with those made by the experimenter.
- ✓ 2. That anxiety (as measured by the IPAT 8-Parallel-Form Anxiety Battery) may be more closely associated with severity of stuttering or with the aspect which causes stuttering moments to become shorter, than with the other factors measured.
- ✓ 3. That stutterers are poor judges of their own speech performances. This clinical impression was borne out by the results.
- ✓ 4. That adaptation to the same passage occurs when read at three-weekly intervals. The influence of familiarity with the experimental situation cannot be eliminated in the consideration of the occurrence of adaptation to stuttering.
- ✓ 5. That a daily schedule concerning aspects of stuttering behaviour can be used as a tool in a therapeutic programme with stutterers, or in investigations studying stuttering change.
- ✓ 6. That the "trend" or variability in stuttering over a period of time can be taken into account when changes in stuttering under experimental conditions are measured.

The beneficial effect of the combination of

/Trifluoperazine ...

Trifluoperazine and Amylobarbitone was evident from three sources of data. The findings were:

1. According to the subjects' verbatim reports, 63.03% experienced varying degrees of improvement in speech with the drug.
2. When the trend of stuttering over two non-medicated periods was taken into account, based on the mean scores of the daily schedules, thirty-seven (80.43%) showed improved speech while on the drug.
3. A significant drug effect was found based on the experimenter's severity ratings. While considering the relationship of severity ratings to the measurement of anxiety as used in this study, it was postulated that reduction of anxiety and tension, brought about by a drug, had greater influence on the severity of stuttering, than on the frequency with which it occurs.

From the results of the study, it can be deduced that the combination of Trifluoperazine and Amylobarbitone (Amylozine) is effective in reducing aspects of stuttering in adult subjects. This and similar drugs could be used with good effect in a therapeutic programme with adult stutterers.

CHAPTER 1

INTRODUCTION

The communicative disorder that has received more attention in speech pathology than any other is stuttering. Since the thirties, there has been a great deal of experimentation on the features that make up the stuttering syndrome. As a result of the therapists' increasing awareness of the problem encountered with stutterers, and depending on their background of interest (psychoanalysis, learning theory, etc.) varied theories have been derived to explain the etiology of the disorder. At the present time there appears to be no one theory of the etiology of stuttering that could withstand critical evaluation. However, there are some authorities, notably Johnson (63, 67) and Van Riper (131, 134) who have not only contributed original theories and therapeutic techniques, but have selected relevant information from other workers so that their approach is also eclectic. Their writings have been of great value and have ameliorated, to some extent, much of the confusion about stuttering that confronts the student when faced with the vast amount of literature on the subject. Despite this, there is still little universal agreement about the etiology of the disorder and, to a lesser degree, the therapy. While there is some agreement about the factual information available concerning the observable facets of stuttering, there are no entirely consistent reasons offered for their occurrence, e.g. sex ratio, familial and twinning incidence, and variation in the frequency and distribution of stuttering.

The earlier approaches to therapy with stutterers were as varied as the theories concerning the cause of it. However, during the last twenty-five years, a major contribution to the approach to therapy with stutterers has been made and this had its nucleus at the University of Iowa. The two main protagonists of this school are Johnson and Van Riper. Johnson's diagenetic theory as to the onset of stuttering influenced his therapy which is orientated towards the reduction of avoidance reactions with semantic re-evaluations of

/the ...

the stutterer's attitudes (62, 64). Van Riper has continued to experiment purposefully and empirically on therapy with stutterers at the University of western Michigan. He has not only been concerned with the reduction of avoidance reactions and fears of the stutterer, but has contributed a great deal in terms of the techniques which emphasize the modification of stuttering behaviour so that the minimum abnormality is present. Rather than concentrate or aim for fluency, as was the case with the traditional therapists, Van Riper suggests that stutterers will always remain stutterers, but that they can learn to adopt a new preparatory set and learn to stutter "fluently". He has also used principles of learning theory in his approach (129, 131, 134).

Although the new techniques are of great value, therapy with stutterers remains a difficult and frustrating task. It is a slow process fraught with failures and emotional crises on the part of the stutterer. Some stutterers, even with intensive therapy over an extended period, show little improvement. The first requirements made on the stutterer are that he becomes aware of what he does when he stutters and learns to practise non-avoidance of stuttering - thus he has to learn to stutter openly without recourse to the avoidance devices that only add to his struggle reactions; at the same time he has to learn to enter feared situations. These therapeutic demands are in themselves anxiety-provoking. The feelings of frustration and anxiety caused by the initial requirements of therapy can be sufficiently threatening to cause immediate failure and discouragement.

Van Riper has said that stutterers live with frustration, penalty and anxiety, and as a result, therapists cannot hurt or threaten them very much more (130). He criticises speech therapists for handling the stutterers "so gingerly" for fear that they (the stutterers) will experience revulsion and anxiety when learning to meet their moments of stuttering. This concept underlying the necessity for the stutterer "to touch the moment of stuttering" certainly has to be implemented for successful therapy to take place. In this regard the speech therapist's approach is very important, but the writer feels that even the most competent therapist can fail to help some stutterers

/contrast ...

confront their speech problem. Many stutterers despondently leave the therapy situation after a period because of the early failures and the emotional demands made upon them. Not all subjects are of the "mettle" that the therapist desires, but all must be attended to. Treatment must then be modified for many cases. Although the methods of treatment at the present time appear to be theoretically rational, in actual practice they are not always satisfactory.

With the advent of tranquillizers to reduce anxiety and tension in psychological states, it has become feasible to consider the use of such medication for stutterers while undergoing the initial stages of therapy. Because of the "cushioning" effect that tranquillizers might have, it is felt that stutterers may conceivably react less adversely to the threat which initial therapy produces and the progress made in therapy may be accelerated.

Before attempting to use medication in the form of a tranquilizer or sedative in conjunction with therapy, it appeared to the writer to be necessary to ascertain the possible effects that a drug might have on the symptoms of stuttering and the general attitude of the stutterer to speaking situations, without the adjunct of formal speech therapy.

Although a number of studies have been published concerning the use of drugs with stutterers, the results are not conclusive. In the majority of studies daily assessments of the speech of stutterers and their attitudes were not considered, and in some cases subjects received therapy concurrently with the drug. Objective measurements were not used in all cases. Many authorities acknowledge that the anxiety component of stuttering is its major feature, but little objective attention has been paid to this aspect in drug trials to date. In most studies tranquillizing agents were used. Although these agents have been reported in the medical literature as being fairly successful in allaying anxiety tension states, they may not have as great a calming effect as is often desired. Tranquillizers (of the phenothiazine group such as used in studies with stutterers) may act as cerebral stimulants and may cause minimal symptoms of restlessness and tension (139). On the other

/hand ...

hand, the use of sedatives with a sedatory subjects does not appear practical. A combination of tranquillizer and mild sedative in the same administration would therefore appear to be a satisfactory compromise.

The purpose of the present study is to ascertain the effects of a combination of tranquillizing and sedatory agents on the symptoms of stuttering, while no speech therapy is conducted. An attempt has been made to construct an experimental design that would take into account the varying aspects of stuttering behaviour. A daily schedule was devised which attempts to reflect the feelings and attitudes of the subjects towards their stuttering, their reactions to the drug, and generally to indicate the average fluctuations that stutterers experience in their speech. Some assessment as to the anxiety component associated with stuttering will also be considered.

The hypothesis underlying this experimental study is that reduction in general anxiety will cause reduction in the severity and frequency of stuttering and that a tranquillizer/sedative combination will bring about a reduction in this anxiety.

DEFINITIONS OF TERMS USED IN THE TITLE

Effects: The results or outcome which can be produced or made attributable to an agent or cause.

Trifluoperazine: A tranquillizer of the phenothiazine group. It is marketed under the trade-name "Stelazine".

Amylobarbitone: A sedative of the barbituric group of drugs. It is marketed under the trade-names: "Amobarbital", "Amytal" as well as "Amylobarbitone".

Combination: The above two drugs were presented as a combination of 2 mg. trifluoperazine and 65 mg. (1 gr.) amylobarbitone. The trade name for this combination is "Amylozine".

Adult: For the purposes of this study subjects of eighteen years or over were considered adults.

Stutterers: These comprise European adult subjects and a small group of urbanized African adult subjects. "African" refers to a Non-European person who is a member of the Bantu-speaking tribes of South Africa. European refers to a white

/South ...

South African who can be considered representative of Western Society.

DEFINITION OF STUTTERING

Many varied definitions of this disorder exist. For the purposes of this dissertation the writer allies herself with Van Riper's recently modified definition of stuttering (134 p 311):

Stuttering occurs when the flow of speech is interrupted abnormally by repetitions or prolongations of a sound or syllable or posture, or by avoidance and struggle reactions.

Johnson's definition does not refer to any form of speech behaviour itself but it infers the presence of anxiety (as Van Riper's definition does) which is relevant to this study (67 p. 217) -

Stuttering is an anticipatory, apprehensive, hyper-tonic avoidance reaction.

Wood, in his "Terminology and Nomenclature" (147 p.65), refers to stammering as being synonymous with stuttering. The Speech Foundation of America also lists stammering as being the same as stuttering (120 p.29). The term stuttering will be used in this study. Stammering will be considered to have the same meaning as stuttering but will be referred to only when contained in a direct citation from an author.

SPELLING

Standard English spelling will be used throughout the dissertation. American spelling will occur only when contained in direct citations.

ITALICS

Words or phrases underlined in direct quotations represent the emphasis made by the authors cited.

PAGE REFERENCES

References to specific pages will be given for quotations or opinions of authors when their work has been contained in book form. Citations or opinions of authors appearing in journals will not be referred to by specific page numbers in the text, but the complete page numbers of the relevant articles will appear in the Bibliography.

PRESENTATION OF CHAPTERS

Chapter 2 is intended to be a perspective of the literature on anxiety, stuttering and its relationship to anxiety, stuttering among Africans, drugs in relation to stuttering, the effects of Amylazine on anxiety states and the forms of measurements of stuttering behaviour and anxiety.

Chapter 3 deals with the methods and procedure of the study which includes the subjects, pharmaceuticals, description of the measurements used, general procedures and the statistical approaches used.

Chapter 4 concerns the results of the study. The data and statistical analyses will be presented for each aspect followed by discussion.

Chapter 5 deals with the conclusions drawn, the limitations of the experiment and suggestions for future research.

CHAPTER II

A PERSPECTIVE OF THE LITERATURE ON RELEVANT FACTORS ASSOCIATED WITH STUTTERING

The aim of this chapter is to present a review of the literature pertaining to the nature of anxiety; its relationship to stuttering; stuttering among Africans; the results of drug therapy with stutterers; the effects of Amylazine on anxiety states; and the manner in which these factors may be assessed by various forms of measurement.

Some attention will be given to the subject of anxiety as it features predominantly in the problem of stuttering. Anxiety has been referred to descriptively in clinical observations about stuttering, and it has also been studied experimentally in association with certain aspects of the stuttering syndrome. The anticipation of stuttering and the apprehension felt about imminent poor speech performances, precipitates worry and anxiety in the stutterer. A common contention among the authorities is that the amount of anxiety and fear felt about stuttering bears a direct relation to the amount and severity of stuttering. The reference to anxiety in this study pertains to its reduction possibly brought about by a drug, thereby lessening the frequency and severity of stuttering. Apart from the use of an objective measurement of anxiety in this particular study, the subject of anxiety per se will not be dealt with in any great experimental detail.

SECTION 1 - ANXIETY

The purpose of this section is to put forward interpretations explaining anxiety. It does not purport to deal with the subject in any detail, nor will it indicate any definite intention on the writer's part to ally herself with any particular viewpoint. The information serves as a point of reference to the following section on the relationship of anxiety to stuttering.

/The ...

The interpretations of anxiety are diverse in nature and appear to depend largely on the psychological orientation of the authors concerned. The explanations extend from a biological viewpoint (Goldstein 45, 46), to a psychoanalytical approach (Freud 41) to an appraisal based on learning theory (Mowrer 93). It will become apparent that most of the authors cited are aware of the problem of the differentiation between "fear" and "anxiety".

Goldstein's (45, 46) concepts of fear and anxiety are derived from his work with brain-injured persons. In defence of this approach he says that a disease process is a significant modification of a normal process and can be recognized as an indication of lawful variations of the normal life process (45 pp. 10-11). At the outset Goldstein says - "Anxiety has no 'object'". The basis of fear is threat of the onset of anxiety." (p. 291). The person "in fear", he says, knows anxiety from past experience and anticipation (p. 297). He differentiates fear from anxiety in that it has an object and has appropriate defence reactions and patterns of bodily expression. Anxiety, on the other hand, causes "meaningless frenzy" with rigid or distorted expression (p. 293). Goldstein states that it may be true that an increasing state of fear may ultimately turn into a state of anxiety. This, he cautions, may be misleading as the emotional state of anxiety should not be confused with an emotion that recognizes specific objects. Elsewhere (46 p. 92) he explains that superficially fear may have many of the characteristics of anxiety, but it is intrinsically different.

The catastrophic reactions of Goldstein's brain-injured patients led him to believe that they contain the characteristics of anxiety. He says - "... the anxiety has no corresponding content, and is lacking in object" (45 p. 295). Anxiety, says Goldstein, is present in the infant who is still in the process of developing abstract attitudes - fear would develop later. The mechanism underlying the reaction of anxiety in patients with impaired abstract attitudes is important, maintains Goldstein, for understanding normal human behaviour (46 p. 95).

/Freud ...

Freud was inclined to regard anxiety states as a re-production of the trauma of birth (41 p.133). He felt that anxiety was an affective state and that symptoms were created to avoid the development of anxiety. According to him anxiety is the signal, and the ensuing symptoms are created in order to avoid the danger situation (pp. 131-135). Mowrer (93 p.553) compares Freud's terms "objective" anxiety to "fear" and says that Freud never discussed normal anxiety which is different from fear and from neurotic anxiety. Freud, however, says the following in his "Supplementary Remarks on Anxiety" (41 p. 165):

Anxiety (Angst) has an unmistakable relation to expectation; it is anxiety about something. It has a quality of indefiniteness and lack of object. In precise speech we use the word 'fear' (Furcht) rather than 'anxiety' (Angst) if it has found an object.

Freud goes on to say that realistic anxiety (presumably the "normal" anxiety of Mowrer's) occurs about a real and known danger and that neurotic anxiety is about an unknown danger - "Neurotic danger is thus a danger that has still to be discovered" (p. 165). In his concluding remarks about anxiety Freud says (p. 166):

Anxiety is therefore on the one hand an expectation of a trauma, and on the other a repetition of it in a mitigated form.

The subject of anxiety has received a great deal of attention from May (86) who says that its special characteristics are the "feelings of uncertainty and helplessness in the face of danger" (p. 190). May suggests that the problem can be made more lucid when we question "what" has been threatened, in the experience of the individual, that produces the anxiety. He has attempted to differentiate "fear" from "anxiety". Anxiety, he states, is the generic term - the organism reacts to threats to its existence and values, and thus anxiety is the "basic underlying reaction". After maturation the organism is able to differentiate specific objects of danger by specific protective reactions. This, May contends, is fear - it is "the expression of the same capacity in its specific, objectivated form" (p. 204). According to May various fears are experienced by the individual on the basis of the security pattern which he has developed, but in the case of anxiety it is this security pattern which is threatened (pp. 204-205). He does not go into

/the ...

the application of learning theory to anxiety and fear, but he does say that the particular events which have threat value to the individual depend upon learning and that "these events are the 'conditioned stimuli'" (p. 207). He defines anxiety as follows (p. 191):

Anxiety is the apprehension cued off by a threat to some value which the individual holds essential to his existence as a personality.

Cattell and Scheier (29) have done a great deal of experimental quantitative research on personality, and through their approach of factorial analysis have developed a new attitude to the study of the range of personality. Among the many factors studied, anxiety has received much of their attention. They have formulated that anxiety is a single trait that is stable and can be replicated by measurement (pp. 50-96). Anxiety appears in their empirical research as a single factor-dimension. They have also considered distinctions made within the anxiety concept itself - i.e. free, situational, bound and characterological anxiety (pp. 102-103). Their pre-metric clinical conception of anxiety is that it is a response to precursory signals of perception of the true feared objects. They elaborate further that it is a tentative alerting by cues and symbols rather than by danger that is present and concrete and therefore has the associated qualities of uncertainty and a long-lasting effect (p.12). Fear, on the other hand, is referred to by these authors, as a specific quality of introspected emotion associated with hypothalamic and visceral reaction patterns and is the affective aspect of the escape drive (p. 11). Cattell and Scheier state that they are uncertain of the process of modification from fear to anxiety but describe the process as follows (p. 12):

The anticipatory character, the fact that signals are not invariably followed by what they signal, the uncertainties about stimulus generalization, the future reference instead of the present precept - all suffice to modify the quality, intensity, certainty, and duration of the fear response pattern into the pattern which we are accustomed to call anxiety.

Later in 1962, Cattell (26 p. 820) reiterated that anxiety is a single underlying factor and a manifestation of "changing stimulation and internal condition". He criticized various existing personality scales as they do not indicate

/differences ...

differences between neurotics and normals - "they confounded neuroticism and anxiety". He maintains that the work resulting from a factorial approach gives anxiety an independent concept (p. 847).

Mowrer (93), who has associated himself with C.L. Hull's learning theory, states that anxiety is a learned response, "occurring to 'signals' (conditioned stimuli) that are premonitory of situations of injury or pain (unconditioned stimuli)", and is therefore "basically anticipatory in nature". He points out that anxiety in situations that are not dangerous, or the lack of anxiety in dangerous situations, have a "disproportionality of effect" and this can lead to psychoneurosis or neurotic anxiety (p. 26). The ambiguity that arises in the interpretation of anxiety which is complicated by the reference to fear is also considered by Mowrer. He puts forward the theory that a normal person can have fear without anxiety but that this fear may be one part of a conflict which can be sufficient to reach anxiety proportions - the fear "represents ego involvement and threat-to-self" (pp. 560-561). In his definition he appears to equate fear and anxiety (p. 17) - "...anxiety (fear) is the conditioned for ... the pain reaction". This anxiety, says Mowrer, has a useful function as it will motivate and reinforce behaviour which will tend to avoid or prevent the pain-producing stimulus from recurring. He distinguishes the "normal anxiety" from "neurotic anxiety" where an individual represses the fear element in order to eliminate the normal anxiety and resolve the conflict (p. 17).

Dibner (33) considers anxiety as a momentary state, not as a "personal constant" and feels that it is directly related to the degree of ambiguity in the situation where an adjustive reaction must be made by the individual. The "uncertainty" present in a situation is increased when there is ambiguity. However, Dibner makes it clear that anxiety is not always dependent on ambiguity in a situation. In this instance it would occur where the ego is involved and where an adjustive response is called for. Dibner believes that there are not only individual hierarchies of defences, but some individuals can use their defence system for all conflict situations -

/others ...

others employ various reaction mechanisms, depending on the nature of the situational conflict and its relevance to the unique personality of the individual. He concludes that anxiety may be an emotional state not subject to *stable* measurement in any group of individuals or for any one person in different circumstances of stress and motivation.

The problem of measuring anxiety by various scales has been discussed by Sareson (106). He suggests that the unreplicability and inconsistencies that have been reported are not necessarily due to the unreliability of the measuring instrument, but rather to variables such as characteristics of subjects and experimenters, the population tested, and the instrument variables. These factors, he says, confound the anxiety measures.

Workers have encountered some difficulties while employing physiological measurements to test levels of anxiety. Calvin et al. (24) found that a physiological measurement (Palmar Perspiration Index) did not correlate with a psychological scale (Taylor Anxiety Scale). They considered that the two tests measured two different facets of behaviour. The differences between fluctuant and steady expression of anxiety was found by Scheier (109) who showed that systolic pulse pressure did not "associate with typical and permanent anxiety-level differences between different persons". Similar results were reported by Berlinsky (12) who did not find any high correlations between four transient anxiety measures (skin conductance, pulse rate, respiratory amplitude, and rate of respiration). He felt that each test was measuring different responses with little relationship between any of the individual patterns of response. He also concluded that there was confusion and doubt in relating measurements to a "supposed anxiety state in a particular person".

Recently Haywood (57) conducted an experiment on the effects of delayed auditory feedback on palmar sweating, heart rate and pulse pressure. The experimental situation was concerned with the deliberate disruption of speech (not stuttering). He found no change in heart rate or pulse pressure, but found a significant increase in the Palmar Sweat Index.

/It ...

It has been contended by Kamin et al., (74) that the measurement of individual differences in anxiety has not kept pace with the theoretical advances that have been made. They felt that the fundamental difficulty in studying anxiety is that the concept does not refer to a single unitary trait (as Cattell believes) but to a number of independent dimensions of behaviour which must still be isolated.

Lehmann (82 p. 110), while discussing the criteria for entities that are investigated in psychiatry and psychopharmacology, says that anxiety is one of the most important psychiatric problems but one which still presents semantic and methodological confusion. Its meaning is determined almost by an arbitrary choice of criteria and these, he says, are made the basis of systematic investigations. In terms of the methodological problems, he points out that all diagnostic criteria are derived from clinical judgement and complains that this fact is frequently obscured and forgotten. He criticises Eysenck in this regard, describing him as one of the research workers who has applied modern statistics on the basis of original clinical judgements to derive central tendencies and factors that represent secondary criteria. Cattell, perhaps, can be criticised in the same manner as his approach is similar in that he has used factorial analyses to denote personality characteristics (26, 29). Yet Cattell himself (29 p. 439) has stated that it is scientifically necessary to commence an experiment with a large number of alleged manifestations of anxiety including those that have been collected in the semantic reference of verbal labels - then it must be determined whether these manifestations of anxiety "vary together", or whether they can be divided into several distinct varieties of anxiety. Cattell points out (p. 449):

... the chief concepts with which anxiety can be confused, both theoretically and in setting up measurement devices, are neuroticism, stress response, fatigue, and adrenergic response.

From the above comments it appears as if there is great variation in meaning as to what constitutes anxiety. The problem is extended further because of the use of the terms "anxiety" and "fear". The majority of writers cited seem to

/describe ...

describe anxiety as being anticipatory in nature due to an apprehension of previously feared experiences. This concept of anxiety is one that appears to have won acceptance among certain speech pathologists when describing the role of anticipation in stuttering behavior. The fact that an accepted criteria of what constitutes anxiety has not been established is evident in the contradictory reports on experimentation where use has been made of physiological measurements and correlations with anxiety scales.

SECTION II - STUTTERING AND ANXIETY

The description of the symptoms, apparent emotions and feelings of stutterers have been referred to in most of the writings by speech pathologists. Many of the respected authorities in the field of stuttering are, or have been, stutterers themselves (Johnson, Van Riper, Sheehan, Bluemel, Williams) and this has given a poignancy to many of the remarks made, especially those concerning the feelings of the stutterer. Attention has also been paid to the stuttering act itself and the speaking situations with which the stutterer is confronted. The stutterer has been referred to as being tense, neurotic, oversensitive, hostile, socially withdrawn, anxious, obsessive-compulsive, to mention only a few of the descriptive terms used.

A number of workers in the field regard stuttering as a neurotic symptom and the result of deep-seated emotional conflicts. Coriat (30) considers that stuttering is a persistence into adult life of infantile nursing activities - "as narcissistic infants they have compulsively retained them". A similar point of view is held by Travis (129 p. 960) who says that stutterers "revealed endlessly a nostalgia for their culturally disavowed, biologically rooted pleasures of sucking, eating, evacuating and exploring." He defines stuttering as "an advertisement of strong, unconscious motives of which the stutterer is deeply ashamed" (p. 919). In an earlier work Travis (123) reported that stuttering is a defence designed to prevent anxiety from developing when certain impulses threaten to expose the stutterer.

The approach-avoidance conflict theory has been put

/forward ...

forward by Sheehan (111) to explain the moment of stuttering. This concept is based on learning theory and the fear reduction hypothesis. Reference, however, has also been made to this conflict in psychoanalytical terms by Glauher (44), who referred to the expression of the struggle that the stutterer has between the wish to speak or not to speak. Sheehan (111) himself says that, apart from learned avoidances which result from specific speech experiences, there are unconscious motives for avoiding stuttering such as inhibition of unacceptable feelings. He states that stuttering has a function similar to that of many neurotic symptoms - "it 'binds' the anxiety and has the property of reducing it".

The view has also been expressed that stuttering is a covert expression of hostility. Abbot (1) is of the opinion that stutterers have a great deal of repressed hostility because of the fear of being rejected and embarrassed. He suggests that the reason for the stutterer's reluctance to discard his secondary symptoms during therapy may be due to his need for "self punishment to atone for guilt feelings toward the auditor". Santostefano (105) argues that anxiety and hostility should be viewed as interrelated emotional states and he developed the theory that "most stutterers, because of their enduring emotional disposition, exhibit general anxiety and hostility".

Blumel (17 p. 127) believes that stutterers have personality traits which predispose them to the disorder - he says that they are "diffident, sensitive, self-conscious, indecisive, tense and easily confused". The disorder, Blumel says, is due to a disorganization of function and it is perpetuated by conditioning. He likens stuttering to psychoneurotic disorders and refers to the obsessive-compulsive reactions and personality changes of stutterers.

The concept of anxiety in relation to stuttering has been applied in various ways. The majority of writers in the field refer to anxiety as the reaction of the stutterer in an attempt to gain fluency. A smaller group, however, such as those with the psychoanalytical orientation as cited above, believe that anxiety is basic and stuttering is a reaction

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and a symptom of this (30, 123). These views have come about in most cases as a result of clinical observations and the application of psychoanalytical approaches and theories. Only in a few cases have projective and other psychological tests been applied to support this view (9,12,19,105,143).

Goodstein (48), Sheehan (112), Bloodstein (14) and Adler (2) have examined numerous studies dealing with personality and projective tests on stutterers. They all agree that these tests lack agreement with each other, and further, that there are no special personality characteristics which differentiate stutterers from normal speakers. Goodstein (48) found the studies inconsistent due to methodological inadequacies and failures of cross validation. He reviewed forty-five studies and came to the conclusion that stutterers do not appear to have a particular personality pattern and are not more neurotic or maladjusted than non-stutterers, as is often contended. However, he did find some indication that stutterers appear "somewhat more anxious, tense and socially withdrawn". Sheehan (112) critically evaluated twenty projective studies on stutterers and found that they were not consistent either internally or with each other, and that, except for a lower level of aspiration of stutterers, no reliable differences existed between stutterers and normal speaking controls. Sheehan stated in conclusion "... if personality differences are substantial enough to be worth talking about (they) should have made their appearance in several of the studies".

The question may be asked, "Is the average stutterer more neurotic or maladjusted than non-stutterers?" Bloodstein (14 p.44) says the answer to this is elusive. He points out that the weight of evidence does not indicate that the average stutterer is neurotic or maladjusted. He adds that there do not appear to be any typical personality traits that would distinguish stutterers from normal speakers. However, he does say that there is some justification for the statement that "stutterers on the average do not appear to be quite as well adjusted as are typical normal speakers". Following on from this, he states that the stutterer can be distinguished in terms of specific attitudes associated with features of the speech process - that they avoid social contacts requiring

/speech ...

speech "is true by definition". Adler (2) also came to the conclusion that there is no one personality factor common to stutters and that anxiety has not been found to be present in an abnormal degree among them. He makes a similar comment to Goodstein (48) that those personality differences that have been noted in some studies are probably due to differences in procedure and definition rather than to any real personality difference.

Investigators have used words such as "fear", "expectancy", "anticipation", "anxiety", "avoidance", "apprehension" when discussing stuttering behaviour. The intent of these words is similar and is probably highly interrelated when considered in relation to stuttering. They have been used in contexts where empirical observations about stuttering have been made rather than where theoretical considerations have been offered.

"Without anxiety concerning the stuttering, there would be no stuttering" state Johnson and Trotter (71). They feel that anxiety is the direct cause of stuttering and that therapy should be directed to reducing the strength of the anxiety.

There appears to be a direct relationship between the degree of anticipation of difficulty and the amount of stuttering which consequently occurs. According to Bloodstein (15) it is possible to employ the word "fear" in a special sense as the anticipation of frustration and that by this definition stuttering is probably always preceded by fear. Fletcher (as quoted in Hahn, 54 p. 33) says

.... it is not fear in general, dread, worry and anxiety or worry in general, but fear, dread, worry and anxiety experienced in anticipation of the necessity to speak under certain definite conditions which sets off the stuturer's pathological reactions.

Stuttering comes to be expected. It is usually associated with past experience of speech failures. The cues that set off the expectancy or anticipation of stuttering are related to sound, word and situational fears. The consistency effect, where the moments of stuttering tend to occur on the

/same ...

same words, confirms the presence of anticipation of stuttering. Johnson and Knott (69) first reported this effect in 1947. In 1960, Bloodstein (15) found clear evidence of the existence of consistency in stutterers of three to six years of age, and concluded that even in such young children, anticipation "underlies the seemingly unconscious repetitions and prolongations in its very earliest forms". He says later (16) that when the stutterer "fears stuttering, he by definition anticipates it".

The tendency to avoid feared words and situations is a common characteristic of stutterers and this avoidance in itself increases the problem. In the secondary stage of stuttering, according to Van Riper (134 p. 332) "we find fear as the major covert symptom and avoidance as the overt one". He says that the stutterer, as a result of his experiences, fears specific words, communicative situations and certain listeners, and that he also tends to develop general anxiety states. By fear Van Riper means the expectation or anticipation of unpleasantness (p. 335). Van Riper states further that when the word is said, irrespective of the stress contained in the utterance, it is followed by release from punishment and consequently the stuttering moment "gets powerful reinforcement and strengthening. ... (In) most cases, the actual release from blocking is due to the fact that the stutterer has sufficient abnormality to satisfy his morbid expectation". (p. 335). This view has also been put forward by Sheehan (111) and Wischner (144) who say that, by having the block, the stutterer immediately reduces the tension and fear that elicited it in the first place.

The evidence of the existence of anticipation or the expectancy of stuttering, together with the fears associated with it, is provided by the ability of the stutterer to predict his moments of difficulty. Van Riper and Milisen (136) have shown experimentally that predictions of stuttering moments can be made just before the speech attempt.

Johnson (63 p. 29) speaks of "anxiety deconfirmation" in treatment with stutterers and says that, as the anxiety is reduced, so the frequency and severity of the avoidant

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reactions will be reduced. He refers to anxiety and fear as one component and points out that "normal speech lies in overcoming the fear of stuttering."

It would appear that Johnson's definition (67 p. 217) particularly supports the views expressed above:

Stuttering is an anticipatory, apprehensive, hypertonic avoidance reaction.

Stutterers have experienced many penalties in their educational, social and vocational lives. It is not surprising that they become anxious about their speech when we consider the premium set and the demands made by our society for fluent speech. A higher incidence of stuttering was found by Morgernstern (91) among those socio-economic groups who attached greater importance to speech fluency. The same observation was made by Johnson and his associates (66 p. 248) in their study of the onset of stuttering, where it was noted that families of stutterers tended to be "upwardly mobile in their social class orientation ... (and) may be particularly motivated to make such reactions". Moncur (90) found adverse environmental influences operating in families of stutterers as compared with families of non-stutterers, including "excessively high standards". He also reported that mothers of stutterers tended to humiliate their children for poor speech performances. The assumption was made by Santostefano (105) that the stutterer is placed in a fairly constant state of stress, not only because of continual imminent negative reactions demonstrated by his environment, but also because of his self-esteem, security and identity. The stress, continues Santostefano, ultimately results in predominant and enduring stages of anxiety.

EXPERIMENTAL STUDIES CONCERNING ANXIETY AND STUTTERING

The nature of anxiety associated with stuttering has not been clearly ascertained and conflicting views have been presented. Little systematic work has been conducted experimentally in an attempt to resolve, and possibly define, the kind of anxiety and the role it plays in the stutterer's problem. Those tests that have been applied to stutterers, were in the first place devised for the assessment of general

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psychological states and are therefore not necessarily relevant to stutterers. The same limitation applies to the use of physiological measurements to ascertain anxiety level in stutterers where any anxiety present is presupposed to be similar to that exhibited by normal speakers. Some experimental studies have dealt with induced anxiety in stutterers in the laboratory situation and have been based on the tenets of learning theory, but again the specific nature of the stutterer's anxiety has not been established. This problem has been referred to by Wischner (1945) who poses the question: "Is anxiety in stuttering unique ... and does it bear a relationship to other behavior assumed to be driven by anxiety motivation?". He concludes that anxiety has certain functional properties similar to those assumed in other experiments where anxiety has been manipulated.

Wischer (1945) studied the role of expectancy and anxiety in stuttering behaviour and found that any change in a verbal stimulus, following initial experience with that stimulus, resulted in change in specific word anxiety. Variation in anxiety was also noted as the speech situations were changed.

Berlinsky (12) used the Saslow Screening Test as a measure of chronic anxiety and found that the stutterers did not appear more anxious than the non-stutterers. This contradicts Boland's (19) findings that the level of chronic or general manifest anxiety was higher for stutterers than non-stutterers on the Welsh Anxiety Index and Taylor's Iowa Manifest Anxiety Scale (both derived from MMPI scales). Besides these measures, Boland used a speech anxiety projective test devised by himself (consisting of cartoon figures) and a self-rating scale for stutterers. He noted that the level of anxiety was significantly higher in speech situations for stutterers compared with non-stutterers, and that the stutterers tended to express their anxiety overtly rather than to repress the anxiety. Persons with high levels of speech anxiety tended to rate themselves as less competent in speech situations. Because of the low correlations obtained between Boland's measures, he suggests that general anxiety and speech anxiety may be relatively independent.

/Brutten ...

Brutten (21) found that stutterers were not very different from non-stutterers on the Maslow Test of Insecurity when the anxiety factor was considered. Twenty-five per cent of the stutterers in his study scored either "true neurotic" or "situational neurotic", and he suggests that different tolerability levels exist among stutterers due to psycho-social pressures. Frick (42) investigated the effect of threat and administration of punishment (electric shock) upon the frequency of stuttering. It was found that the greater the expected penalty, the greater the frequency of stuttering. He felt that his results supported the hypothesis that stuttering is anxiety-motivated behaviour.

Sheehan (110) experimented on stutterers with a variable which consisted of a non-reinforcement situation where the subject read an experimental passage and was asked to stutter repeatedly on a word before proceeding with the reading of the passage. There was a significant reduction in stuttering. This was considered as relief from anticipatory anxiety, which Sheehan says is learned behaviour.

The assumption was made by Goss (49) that stuttering frequency is a direct function of the strength of an antecedent and/or concomitant anxiety state. He felt that it was a "joint function of word stimulus characteristics of speech situation variables". He applied learning theory principles to stuttering behaviour where anxiety and fear were considered a function within the stimulus-response structure, and where the anxiety is learned and relatively stable. His theoretical problem was to determine the relationship between anxiety and the duration of a stimulus arousing anxiety. He observed the relationship between the frequency of stuttering and the varying periods of time of word presentation. He found that the word-cue duration was downward-upward in form. The decay of anxiety occurred with anticipation of the word exposure. The subsequent rise was attributed to the word-cue duration which was the experimental variable. Accordingly, two sources of anxiety were observed - one was the anxiety resulting from the word exposure that was to come (anticipation), and the second source was the time interval between the word stimulus and the signal to say the word. Later Goss (50) supported his earlier work and

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concluded that there was an increase in anxiety due to the anticipation of the presentation of word cues.

Wischner (146) obtained similar results to Sheehan (110) regarding the moment of stuttering, where he suggested that a feared word aroused anxiety tension which was reduced upon completion of the stuttering act, with consequent reinforcement of stuttering behaviour. Sheehan (110) refined his observation further and said that the stutterer's attempt of the word (before the act is completed) is sufficient to decrease the anxiety and tension and this allows him to complete the word. More recently Sheehan et al. (113) reiterated this - "... a significant fear reduction is held to occur during the block, reducing avoidance sufficiently to permit release of the blocked word".

In the thirties and forties much attention was paid by investigators to the conditions under which stuttering changes. Generally, there appeared to be a change in stuttering behaviour associated with situations which provided more or less anxiety. Some of the pertinent studies in this series were conducted by Barber (on chorus reading) (6), Porter (on the size and personnel of the audience) (101) and Johnson and Rosen (on different rates of reading) (70).

An important study was done in 1927 by Van Riper (126) on the preparatory set of stutterers. He defines the set as "a pre-stimulus neuromuscular adjustment which selects, determines and controls the response to the expected stimulus." Van Riper explains how this set can influence the duration of the stuttering spasm and become habitual in association with feared words. As early as this Van Riper saw the significance of the preparatory set in terms of therapy and suggested that this set and the stuttering spasm be modified to a "form which carries little social penalty", where fear and expectation of stuttering can be decreased. The present authoritative works on therapy with stutterers by Van Riper refer to many of the principles contained in this early article (129, 131, 134).

Psychologists have long utilized physiological measurements to ascertain characteristics of and reaction to

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emotion, including anxiety and tension. In some instances, experimental use of these measurements has been made with stutterers, and in particular, in relation to anxiety about stuttering. Berlinsky (12) compared stutterers with non-stutterers in four conditions of experimentally induced anxiety (familiarization, anxiety with speech permitted, anxiety with no speech permitted, and anxiety with speech used to direct another operator). He used four measures of transient anxiety in these situations (skin conductance, pulse rate, respiratory amplitude and rate of respiration.) He found that these measures did not correlate highly with each other and that each test appeared to be measuring a different type of response; also that there seemed to be little relationship between any of the individualized patterns of response (p. 58).

Recently Buitten (21) pointed out that the independent measures of anxiety used to support the theory that adaptation in stuttering was due to reduced anxiety, were basically tautological. He used a palmar sweat test and found that this covaried positively with adaptation in stuttering and that there was no such association with non-stutterers. He felt that the theory referred to was supported by the results of this physiological measurement. Umedo (127) found positive changes in the galvanic skin reflex (GSR) among stutterers from "silent reading" to reading aloud as compared with non-stutterers.

Berlinsky (12 p. 6) feels that the lack of experimental investigation in terms of the measurements of anxiety in relation to stuttering may be due to the following :

1. Difficulty of arousing and maintaining anxiety in the laboratory.
2. Difficulty of studying the anxiety occurring under normal conditions, and
3. Lack of interest on the part of speech therapists in verifying experimentally their clinical observations.

In view of the lack of objective and conclusive evidence it is therefore difficult to ascertain whether anxiety is a cause of stuttering or whether stuttering is

/a ...

a cause of anxiety. The nature of anxiety itself is confusing and many interpretations exist as was previously discussed. From the literature on stuttering it appears that anxiety, as a component of the stuttering complex, has been accepted but not clarified in terms of its exact nature or role. The observations about the association of anxiety with stuttering have, in the main, been based on clinical observations. Irrespective of the role of anxiety in stuttering behaviour (causative or consequent), this component cannot be ignored in the handling of the stutterer's problem, and its reduction must be considered a major aim of therapy. It is felt that the reduction of anxiety could possibly be brought about by the action of a tranquillizer/sedative. Any lessening in the frequency and severity of stuttering could be attributed to a decrease in the feelings of anxiety and apprehension concerning the stutterer's speech. This is not to say that any drug will eliminate either the symptom or the poor attitudes displayed by stutterers in speaking situations. The contention here is that, if anxiety is minimized, the stutterer would experience greater facility in speaking - this, with speech therapy, may lead to a matrix in which the stutterer may be permitted to learn to modify his stutter in a more acceptable manner.

SECTION 111 - ANXIETY AND STUTTERING AMONG AFRICANS

The foregoing material presented on stuttering pertains to Europeans in Western civilization, and in particular to Americans. Anthropological writings on Africans in this country are fairly abundant but there appears to be a paucity of literature on the personality of the African, especially the urbanized African. The transition from the rural tribal communities to the urban environment, with its strong European influence, has had, and continues to have, a profound effect on the social, economic, linguistic, religious and psychological life of the African. De Ridder (32) recently administered a modified version of the Thematic Apperception Test on 2,500 male urban Africans. He stated that the personality of the subjects was characterized by strong feelings of anxiety and insecurity. The protocols of his subjects indicated that this conclusion was due to the nature of their lives in an

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urban township where financial difficulties are accentuated (p. 155). Among Africans in Nigeria, who are less urbanized than in South Africa, Lambo (79) observed that anxiety states constituted the most common type of emotional disturbance. He said - "In primitive Africans it (anxiety) runs an acute course in contrast to its tendency towards chronicity in literate Africans". Perhaps the same observation could be made for urbanized, as opposed to rural, Africans in this country. Carothers (25 p. 149) feels that anxiety states in Africans are closely similar to those seen among Europeans and that typical symptoms can take the form of gastric and cardiac neuroses. Psychiatrists working among urbanized Africans in Johannesburg, have reported to the writer that the anxiety states found in their patients resemble those of the Europeans (11, 103). The manifestations that occur are practically identical - palpitations, dizzy spells, headaches, etc. (11, 103).

The existence of stuttering among Africans of the Bantu-speaking tribes of South Africa has been established by Aron (3) in a preliminary exploratory study. Although the survey concerned stuttering among school-going children on the Witwatersrand, an urbanized area, it can be presumed that the disorder known as stuttering exists among Africans in this country. A number of her subjects came from rural areas where the onset of stuttering had already occurred before urbanization (p. 146). The presence of words in the various Bantu languages to describe stuttering was noted and was thought to exist before the advent of the influence of white men (pp. 154-155). The incidence of this disorder in the group that Aron studied, namely 1.26 per cent of the population, is very similar to the incidence for stutterers elsewhere (p. 99). In addition it was observed that the general nature of the stuttering pattern among these subjects, together with the type of struggle responses presented, did not differ markedly from what is known and observed among European stutterers. She noted, however, that a number of struggle reactions of the stutterers consisted of "simple" yet "large movements involving the hands and feet", and these gave the impression of being "unsophisticated" (p. 126). The explanation was offered that these "unrefined" movements may possibly be due to a minimum of anxiety and internal pressures on the part of some of the children in an

/attempted ...

attempt to conceal their overt symptoms.

The type of occupation performed by parents of African stutterers and non-stutterers was reported by Aron (pp. 140-145). Although it was difficult to assess the socio-economic levels accurately, she found that the parents of stutterers tended to hold "higher ranking" occupations than the parents of non-stutterers and offered the comment that such parents may be more "upwardly mobile", be more ambitious for their children, and set relatively high standards in the home.

To the knowledge of the present writer no further work has been done on the nature of stuttering among Africans in this country. Clinical observations on African stutterers receiving speech therapy have been made by members of staff, including the writer, at the Speech Clinic, University of the Witwatersrand. For the purposes of this present study, a discussion was held with members of the staff of this Clinic in order to gain their impressions of African stutterers in terms of symptomatology and the attitudes of African stutterers towards their speech problem. It must be pointed out that their impressions do not necessarily apply to all African stutterers and are subjective clinical impressions. The following comments and observations were made:

1. The symptoms of stuttering, and its development in Africans appears to be essentially the same as observed in European stutterers.
2. It was noted that some of the secondary stuttering reactions of the Africans tended to be bizarre and "unreined". This was also observed by Aron (3 p. 126). It was felt by the clinicians that this could possibly be due to some lack of inhibition in displaying stuttering behaviour on the part of Africans. Europeans tend to be more reticent and controlled about the symptoms which they allow to be seen. Many of the stuttering symptoms exhibited by Africans appear to be more overt and "physical" in form than covert and "controlled". The suggestion was made that this "physical" manifestation, which appears to be exaggerated in the

/African ...

African, may result from their belief that stuttering has a physical cause.

3. It was observed that in some African stutterers the sequence of the stuttering moments was almost ritualistically stereotyped with each occurrence. Little variation occurred with some cases, irrespective of the stress contained in any type of speaking situation. In relation to this it was noted that some stutterers continued repeating or prolonging sounds almost indefinitely without varied tension before a "fade-out" took place - it almost appeared as if they were perseverating effortlessly for a long period. This observation did not apply to all African stutterers seen.
4. African stutterers attending the Clinic appear to be as anxious about their speech problem as Europeans. They also experience the same kind of word and situational fears.
5. The opinion was put forward that the African stutterers seem to express their anxieties and fears about stuttering on a more physical, emotional and unsophisticated level than European stutterers. They use such expressions as "sad", "unhappy" while describing their feelings about their speech.
6. African stutterers tend to be more suggestible in terms of therapy than Europeans and it was felt that this could be due largely to the subservient attitude that Africans showed when working under the authority of European therapists. In addition it was thought that this factor may stem from their original cultural backgrounds (e.g. the belief in the witchdoctor).
7. The eye contact of some African subjects was very poor, and this fact could also possibly be attributed to the result of a subservient attitude. One African stutterer was reported to have said - "If I look at your face, I am being rude - I am black and you are white". Poor eye contact could also be due to cultural factors where the role of parental and adult authority is stressed.

8. It was felt that the majority of African stutterers who sought aid at the Clinic came from families where a high level of aspiration for their children existed. In addition, it was felt that these African cases appeared to be highly motivated to improve their speech so that they could complete their higher education and obtain "status" employment. In view of the fact that this observation was made only in terms of those African stutterers attending the Clinic, it must be borne in mind that this factor is not necessarily applicable to all African stutterers.
9. Therapy with African stutterers, at present, follows similar lines to that practised with European stutterers. However, all the clinicians agree that the problem of stuttering therapy with these subjects was increased due to the difference in cultural backgrounds and languages.

From the foregoing discussion it appears that there are some slight differences in stuttering symptomatology between African and European stutterers. These differences are interpreted by the present writer as being superficial and associated with particular cultural backgrounds and are considered not basic to the stuttering problem *per se*. For the purposes of this present study it will be assumed that the syndrome found in African stutterers presents virtually the same picture and manifestations as in European stutterers.

SECTION IV - DRUGS AND STUTTERING

Up to the present time the majority of investigators who have used drugs with stutterers have worked on the assumption that stuttering is a functional disorder associated with anxiety and apprehension. No inference has been made by these investigators that the disorder is due to malfunctioning of the endocrine system or other bio-physiological systems. The theoretical considerations underlying drug treatment with stutterers have been concerned with the reduction of anxiety and tension in order to bring about an improvement in the stutterer's speech. The basis of this theory derives from

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the psychiatric use of tranquilizers and sedatives to alleviate anxiety and tension states. It has been emphasized by many workers that the use of drugs such as tranquilizers is not an end in itself - but that they can become useful as adjuncts to various other therapies.

Bluemel (17 p. 117) states that the elimination of stress is one of the first steps in the rehabilitation of the stutterer, and recommends that the adult should avoid nervous fatigue and should "pattern his life in tranquility". The use of sedatives to diminish tension could be used, says Bluemel, but they cannot be relied upon to relieve stuttering continually.

One of the earliest references to medication and stuttering was by Glaser (43) in 1936. He felt that where stuttering represented conditioning, the symptoms might be increased with glandular stimulation, such as thyroid administration. His comments are based on the information obtained from questionnaires sent to twenty-nine endocrinologists. In 1940 Hogewind (58) administered *Bellergal* to stutterers which consisted of a vagal sedative, a sympathetic sedative, and phenobarbital. He found this medication to be "very effective" in managing the early stages of treatment with stutterers. His observations were subjective and no particular design was utilized in the study. The number of subjects receiving this drug was not mentioned.

Love (83) studied the effects of Nembutal and Benzedrine on twenty stutterers who were receiving speech therapy at the same time. The drugs (and placebo) were administered over four days and in each case the medication was given ninety minutes before the subjects were examined for speech changes. He found that there was no significant decrease in the stuttering symptoms with either the sedative or stimulant. He paid attention to the design and used ratings to determine possible changes in speech. The study could be criticised on the basis that the subjects received each medication on one occasion only in a laboratory situation. Dexedrine was used by Fish and Bowling (38) with speech defectives and mentally retarded subjects. The study was instigated by Fish who took Dexedrine

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for weight control and found that there was "dramatic reduction" in his stuttering. Of all the subjects who received medication, twenty-two were stutterers. Half this group received the drug and the other half a placebo. Tape recordings of speech were made before and after the experiment and a general rating of improvement was made by the combined observations of ward personnel, a speech therapist and the director of the project. Five subjects showed improvement with the drug while only one improved with the placebo. Of the five, three stutterers "improved dramatically", although the authors state that the stuttering was not eradicated - "it was controlled by the patient". No objective appraisal of the changes was made.

Prostigmin was used with ten stutterers by Schaubel and Street (107). They hypothesized that the use of this drug could make the management of the stuttering an easier task if body tension could be reduced. They found the drug to be beneficial. Subjects reported less tension and were more able to cope with their speech. No quantitative data were given and the conclusion as to the effectiveness of the drug was made on observations and reports by the subjects themselves and members of their families. In an attempt to reduce the "hypertonicity" of pre-school children who stutter, Hale (55) used thiamin hydrochloride. A control group received placebos. He found that fifty-five per cent of the children had improved with the drug, although he does not state the number of subjects who took part in the study. He remarks that those who did improve did so within two weeks of treatment and that there was a "substantial improvement" among the two and three-year-olds (eighty per cent). No quantitative results are given and no indication was made on how the improvement was gauged.

Penson (100) also studied the effects of thiamin hydrochloride on stutterers. He used seventeen subjects, with a placebo for control purposes. He felt that the improvement observed in his subjects indicated the possible use of this medication in a speech therapy programme. Hydroxyzine was used with forty-two stutterers by Yannatos (142) who found the medication to have tranquilizing, hypotensor and relaxing properties. It aided the re-education of the subjects "by breaking the pathological cycle".

/Two ...

Two studies on the effects of reserpine on stutterers were available for reference. Mitchell (89) administered reserpine to sixteen stutterers with a placebo acting as control. The study extended over a period of eleven weeks (four weeks medication, three weeks no medication and four weeks medication). Severity ratings and frequency counts of stuttering were recorded and information on various aspects of the stutterer's attitude towards his speech was assessed - this was done mainly from observation and verbatim reports. She found that there was no change in the severity or frequency of stuttering. However, she noted that a majority of subjects reported a tendency towards easier speech with more overt stuttering and that there was a noticeable decrease in anxieties. Excepting for two subjects, the group received speech therapy concurrently with the drug administration, and it is therefore difficult to assess the effectiveness of the drug alone.

Mellert (88) found reserpine significantly beneficial in reducing the stuttering moments of a single subject. This subject was seen over one year where the following sequence took place: reserpine alone; placebo alone, reserpine alone; and reserpine together with speech therapy. Various measurements were taken. The placebo had little effect and reserpine with speech therapy had approximately the same effect as was first noted with the drug alone. This experiment with the one subject was regarded as a pilot study.

Some studies have been concerned with the use of meprobamate with stutterers. Two indicated that the drug was effective. Di Carlo et al. (34) used meprobamate with thirty-two stutterers who were seen once a week for six weeks. This publication was obviously based on a study conducted by Katz (75). The subjects were allocated randomly to three groups - drug, placebo and no medication. The dosage was increased gradually or reduced in individual cases when side effects were noted. Subjects were administered the Iowa Scale of Attitude towards Stuttering at the first interview and the Taylor Manifest Anxiety Scale during the second visit. During the last visit both these scales were given again. No mention is made in the original experiment by Katz (75) that the Taylor Manifest Anxiety Scale was given during the last visit. On

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each occasion the subjects read the same 500-word passage. Frequency moments of stuttering were noted from all recordings, but severity ratings were made only from the tape recordings of the first and last visits (75 p. 27). This is not mentioned in the Di Carlo et al. article (34). Although Katz (75) describes severity ratings in his procedure, he does not appear to have reported on this aspect in his results. A significant trend in terms of the reduction of the moments of stuttering was noted for the drug group and this improvement was progressive with each trial. The placebo and non-medicated groups showed no improvement nor was there any progression as with the drug group. Despite this it is felt that the element of adaptation should have been taken into account especially in the drug group. It is known that repeated reading of the same passage causes adaptation to that passage with less stuttering. Although the study was "controlled", the double-blind technique was apparently not used, nor did the subjects act as their own controls. The groups were not matched.

The study by Maxwell and Patterson (87) on meprobamate with stutterers did not employ any objective measurements. The experimenters selected eighteen stutterers who were seen at intervals of one week during "active treatment" and later at intervals of one month over a period of eight months. All subjects were receiving speech therapy at the same time. Eight subjects were put on placebo. The authors stated that there was continued benefit after control tablets (placebo) had been substituted for the drug. The final number of subjects on placebos was not given and no mention was made as to the basis on which the subjects were finally selected for placebo administration. No detail is given of the criteria used for improvement or change. Improvement was presented as follows: "very good, 33%"; "good 44%"; "little or no improvement 22%". They felt that the beneficial effects of the drug were that it "facilitates speech therapy and shortens the duration of treatment".

On the other hand Fant and Williams (77) found meprobamate non-effective when it was used as an adjunct to therapy. They used fifteen stutterers who were allocated to

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either the drug or placebo group, and the double-blind technique was used where neither the experimenters nor the subjects were aware of the drug or placebo allocation. An attempt was made to match the groups roughly on the basis of the amount of previous therapy, mean severity ratings obtained from judges, and profiles from the Minnesota Multiphasic Personality Inventory. The subjects did not act as their own controls in that the drug and placebo groups were not switched after a period of medication. Subjects were on the drug or the placebo for ninety-nine days. Individual therapy was made available once a week for all subjects and group therapy was held twice a week. Speech interruptions were categorized into types. The frequency of stuttering was counted for each type before and after the experimental period on a 180-word passage. Quantitative data included severity ratings, reading rate, and scores from the MMPI. No statistically significant results were obtained although reading rates were reduced in the experimental (drug) group. The experimenters also made clinical observations and noted that six of the subjects showed a "marked favorable change" and five made a "moderately favorable change". An interesting point made by these authors is that the quantitative measures may be valid in their own right but they did not reflect a consistent direction which was clinically evaluated as "improvement". No reference is made as to the manner in which the experimental or control groups responded to actual speech therapy.

Another study, employing drugs as an adjunct to speech therapy, was done by Hackett et al. (52) - this time using chlorpromazine. The subjects consisted of sixteen children ranging in age from nine to sixteen years. The children were divided into six groups. They received group therapy twice a week. The subjects started on placebo for six weeks and then were given chlorpromazine for six weeks. After this period, thirteen subjects remained and were then divided into two groups by randomization receiving either drug or placebo for a further twenty-four weeks. The therapists did not know the drug or placebo allocation. Speech recordings were made at the beginning and end of the experimental period. The therapists classified the children according to whether they had "greatly improved", "improved", or showed "no change". The

/criteria ...

criteria were based on stuttering symptoms, withdrawal tendencies, emotional attitude towards the speech problem and the degree of control achieved. These criteria appeared to have been used subjectively by the therapists. Of the thirteen subjects, eight were described as "greatly improved", and of these, three were on placebo; four were found to be "improved" and two of these were on placebo; while one subject on placebo was rated as "no change". The authors concluded that the chlorpromazine group did better than the control group and no member of the drug group failed to improve. They noted that after a year four of the subjects from the drug group had continued to improve, as compared with the three placebo subjects who had previously improved and who then showed signs of relapse. Four years later, Hackett (53) in a personal communication to the writer concluded that "the phenothiazine type of tranquilizer (e.g. chlorpromazine) does not do anything by itself but will help reinforce a speech therapy programme."

From the above perusal of the studies on drug therapy with stutterers, it would appear that there are no conclusive results, and that no one study has been conducted for verification purposes. The major factors that prevent an inter-study evaluation are, that the experimental situations are varied, different drugs have been used, different or no measurements have been taken, and in some cases, speech therapy was held concurrently with drug administration.

Some studies cited however, show encouraging results. Often where statistical results showed no significance, clinical observations indicated that the subjects had improved. Kent (76), in her review of work done on drugs and stuttering, felt that no measure that had been used provided any significant data as to the reduction of stuttering. Burr and Malleadore (22) are rather more optimistic about the use of drugs with stutterers. They feel that tranquilizers appear promising and may not only produce a reduction of stuttering symptoms, but may make the subject "less susceptible to the sharp emotional impact of the speech situation". They consider that a drug might be desirable as a tool in the long-range therapeutic procedure and suggest that heavy dosages should possibly be introduced in the early stages of therapy and be gradually reduced as the stutterer becomes easier about the

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therapeutic situation.

SECTION V - DRUG TREATMENT WITH AFRICANS

To the knowledge of the writer no literature exists on the type of reactions exhibited by urbanized Africans in South Africa to treatment by tranquillizers and sedatives. Psychiatrists and neurologists who have treated Africans, have reported, in personal communications, that these subjects tend to react in the same manner as do Europeans on drug treatment (11, 60, 103). Hurst (60) commented that high dosages of tranquillizers for African schizophrenics yielded comparable results to those of whites, and African cases demonstrating anxiety states appear to respond to tranquillizers in the same way as whites.

Reel (103) reports similar observations and is of the opinion that, if there would be any differences, they would not be in the action of the drug, but in the reaction of the African's expectancies of the drug's effect. Reel feels that Africans cannot understand the mechanism of their symptoms (anxiety) and cannot follow any psychological explanation - they appear to comprehend and accept physical causes and symptoms only. He suggests that Europeans did not accept physical side-effects of drugs, but that Africans expect physical reactions to drugs so that they become satisfied that the medicine is having an effect. He reports that he uses the same dosages of tranquillizers and sedatives for African patients as for Europeans.

SECTION VI - AMYLOZINE (TRIFLUOPERAZINE AND AMYLOBARBITONE)

trifluoperazine (tranquillizer)

The majority of tranquillizers falling into the phenothiazine group act on the sub-cortical areas producing degrees of calmness and reduction of excitement and agitation. Hurst (59) states that they act primarily on three neuro-anatomical systems: the reticular system of the medulla, mid-brain and diencephalon; the hypothalamus; and the limbic system, especially the amygdala and hippocampus. He adds that the more potent the phenothiazine derivative (such as

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trifluoperazine) the greater its effect on the limbic system, and this effect can cause extra-pyramidal symptoms. Whiteley (139) feels that the effects of tranquilizers can also be expected to act as cerebral stimulants to some degree through the reticular formation.

Trifluoperazine is a tranquilizing agent of the phenothiazine group. From the majority of reports published on this drug it appears that it is somewhat effective in reducing anxiety and associated symptoms (125). May et al. (85) stated that trifluoperazine was ten times as potent as chlorpromazine on a weight-for-weight basis and felt that the drug is a valuable addition to the range of drugs available for the treatment of psychoneurotic symptoms.

Extra-pyramidal symptoms have been encountered with trifluoperazine, but it appears that they can be eliminated when the drug is administered in low dosage with ambulatory cases. Hudson and Cornman (125 p. 184) studied the incidence of extra-pyramidal symptoms in 4,200 patients and found the incidence of these symptoms to be very low (2.1%) when the dosage was within 2-4 mg. The incidence of side effects was also low when the dosage was increased to 8 mg. daily (3.6%). Drowsiness and lethargy, often produced by similar drugs, seem to be at a minimum with trifluoperazine. Ayd (5) had also considered the side effects of this drug but felt that they could be controlled or eliminated by prescribing low dosages. He observed that the drug was most valuable in relieving tension, anxiety and restlessness. Winkelman (125 p. 80) noted an alertness in his patients on the drug and said "... it gives a state of calmness without sedation", and he added, in some instances "it gives an appearance of excitement". Trifluoperazine has been said to have dual properties. In a study on behaviour disorders among children, Beaudry and Gibson (7) predicted that it provides a calming effect on the hyperactive children and a stimulating effect on the withdrawn children. This was borne out by their results.

Due to the stimulating effect that trifluoperazine can have, Ayd (5) prescribed barbiturates to counteract insomnia that was present in some of his patients who were on the

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tranquillizing agent. He felt that such a combination of treatment was practical as the drug does not potentiate the action of the barbiturates. He administered the drug to eighty-eight patients, both ambulatory and hospitalized, who had anxiety and tension states. Sixty per cent of the total number of subjects improved and he noted that "the more pronounced the anxiety, agitation or excitement, the more striking was the effect of trifluoperazine".

The results obtained by Freed (40) with fifteen out of twenty-three disturbed children were "excellent" with trifluoperazine. Of these fifteen, thirteen children had previously failed to respond to other tranquilizers such as compazine and meprobamate. An anti-anxiety effect was found by Marx (125 p. 94) who used the drug on forty-three patients who had experienced various states of anxiety. He found the drug to be effective in sixty-five per cent of the group studied. Another study by Proctor and Gansu (125 p. 35) reported good results with industrial workers who suffered mild and moderate anxiety. They did not notice any psychomotor or neuromuscular side-effects. Goddard (125 p. 24) treated a hundred-and-four psychoneurotic outpatients with trifluoperazine and found that fifty-four obtained "excellent" results and thirty-three "good" results. He noted that the drug appeared "less soporific than chlorpromazine and most other phenothiazines".

Murst (50) concluded that "the newer piperazine phenothiazine tranquilizers, notably Permital and Stelazine" (trifluoperazine) are more beneficial than other tranquilizers as there is a higher therapeutic response and a lower incidence of neurological reactions and side effects.

Amylobarbitone

Barbiturates (sedatives) are central nervous system depressants and, depending on their strength, can produce varying degrees of sedation from slight, to deep coma. Kubie (74 p. 219) states that the underlying assumption of barbiturates is that they lessen cortical activity and the impulses arising from the deeper centres of the cortex which implement affective states. Various studies on barbiturates

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were evaluated by Wikler (140 p. 157) who found that electroencephalograms indicated that this group of drugs participates in altering emotion, perception and consciousness. Goodman and Gilman (47 p. 126) report that the central cortex and the reticular activating system are sensitive to barbiturates.

Amylobarbitone is one of the well-known barbiturates and has been used in the medical profession for very many years. It is also known as "amobarbital" and is traded under the name "Amytal". It is classified as an intermediate acting drug (47 p. 125). Wikler (140 p. 225) refers to amylobarbitone as a psycholeptic drug which "decreases anxiety, enabling the patient to externalize it".

Amylozine

The combined use of trifluoperazine and amylobarbitone (Amylozine) was first reported by May (84) in 1961. He had noticed the success of each of these two drugs in controlling neurotic symptoms and this led him to conduct a controlled trial using a combination of the two drugs as against amylobarbitone alone. He felt that, as each drug had a different site of action (one cortical and the other sub-cortical), a combination might be more powerfully corrective than either alone. He chose a representative cross-section of thirty-two psychiatric patients of whom five later discontinued the experiment. Cases were randomly allocated to two groups who started on either the combined mixture (1 gr. amylobarbitone, and 1 mgm. trifluoperazine) or on amylobarbitone (1 gr.) alone. These groups were then switched after a fourteen-day period. The study was a double-blind one in that neither the subjects nor the experimenter were aware of the drug allocation. A clinical assessment on a four-point scale was made by the experimenter and patients themselves. He found that all the cases had improved on the combined medication, whereas six did not improve on amylobarbitone alone.

Since May's work, a number of other studies have been conducted using this combined mixture. From the literature on the effects of Amylozine it appears that few utilized any experimental design or controls as May did. Guillaume

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and Sills (51) treated one hundred-and-four patients with Amylozine. They pointed out that the rationale of the combination drug is that trifluoperazine reduces tension and anxiety, and the barbiturate controls the element of hyper-excitability, which the first drug may increase if used alone. The subjects were selected from two urban general practices and were divided roughly into two groups - those having anxiety states, and those having anxiety with depression. They were treated for a period of six weeks. Sixty-eight showed "excellent and good" results, and thirty-two "fair" or "poor" results - four cases defaulted during the study. No side effects were seen. Whiteley (139) observed that the addition of amylobarbitone eliminates unwanted restlessness that may be present when cases receive trifluoperazine alone. He said further "... the addition of amylobarbitone to trifluoperazine was called for to control anxiety either present at the outset or emerging during trifluoperazine therapy." Of the ninety-two cases treated, sixty-five "preferred" the combination mixture and the results were "satisfactory" in thirty-eight of the subjects. Burrows and Goulder (23) reported that sixty-four out of a total of ninety-seven mentally disturbed patients responded "satisfactorily" - "the best results being obtained in the anxiety state group". Wells (137) reported "impressive" results with Amylozine, and both Lazarus (51) and Johnson et al. (72) reported good results with this combined medication.

From these studies it would appear that the use of Amylozine with stutterers is worth consideration. The majority of writers have reported that this drug is somewhat successful in relieving anxiety and tension, and that the side effects are minimal when used in low dosage. The reduction of emotional reactions to stress and anxiety by the application of a tranquillizer appears to be a legitimate approach to treating the stress encountered by stutterers. The impact of stress and anxiety can be counteracted further by causing a slight reduction of awareness which could be brought about by a sedative. A combination of the two groups of drugs, therefore, seems to be a feasible and practical form of medication for stutterers. It should be reiterated that such drugs cannot bring about complete symptom amelioration. The justification for the use of these drugs with stutterers lies in the assumption that

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they will bring about a reduction of anxiety and feelings of apprehension associated with poor speech performances, which could lead to a lessening in the frequency and severity of stuttering symptoms.

SECTION VII - THE PLACEBO

An important development in drug experimentation has been the use of the placebo. This is usually an inactive substance that is presented in a form visually identical to that of any active drug being tested. The inclusion of the placebo in experimental designs with active drugs constitutes one aspect of the "double-blind" procedure where neither the subject nor the experimenter is made aware of when the active drug is being given. It is designed to eliminate the possible influence of suggestibility when an active drug is presented, and at the same time it enables the efficacy of the drug to be tested.

Suggestibility appears to play a large part in the type of response that subjects produce with the administration of a placebo. According to Beecher (8 p. 63), placebos are increasingly effective with increase in stress and this seems to point to the effect of suggestion. Beecher reviewed fifteen studies where use was made of the placebo in various conditions and found an average effectiveness of thirty-five percent. He lists the following effects that placebos can produce: drowsiness; headache; fatigue; nausea; "warm glow" and relaxation (p. 68). Beecher also found that there were no differences in sex or intelligence in terms of the individuals who reacted to a placebo. He concluded that a person reacting positively to a placebo would be a "recognizable type of individual", but this, he says, could only be detected after intensive interviews and psychological tests (p. 72).

One of the few studies that attempted to distinguish personality characteristics of persons responding positively or negatively to placebos was conducted by Lasagna et al. (80). They found that a person who responded most easily to a placebo tended to be an out-going, somewhat dependent personality, while the person who is not likely to respond to a placebo tends to be a more critical, less dependent and possibly more rigid personality type.

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Trotter (126) points out that, although placebo reactions may usually appear to enhance the drug effect, they may also subtract from it. He suggests that experimenters ought to know the "state of the individual" at the time a drug is given in order to understand the subject's preconceptions of drug treatment and his reactions to medication. He hypothesizes that secondary suggestibility, rather than primary suggestibility, is the trait related to placebo reactions. Wendt and Cameron (135) have expressed their dislike of the term "placebo effect" which implies that the cause of any effect is the capsule itself. The actual causes, the authors state, are more complex. They include the attitude of the subject to the experimenter, the subject's perception of the experimenter, the subject's expectations as affected by the total procedures, and his environment, both in and out of the laboratory. Di Mascio and Kierman (35 p. 363) have conducted studies on the placebo response which revealed physiological, behavioural and subjective changes. They also found that the magnitude of the placebo response in subjects differed according to whether they were on a high or low dosage of the active drug. This phenomenon, they felt, resulted from the situational expectancies set up by the subjects' experience with the drugs used.

In relation to the present experimental study, a pertinent article on sugar placebos and stuttering was written by Palasek and Curtis (93). They questioned the use of lactose which formed the substance of placebos used in some of the studies on drugs and stuttering. They referred to the work of two investigators (Kopp and Seeman) who suggested that there is a relationship between stuttering and increased blood sugar content. Palasek and Curtis administered three types of placebo to nine stutterers - lactose, calcium carbonate and a combination of these two ingredients. The study extended over seventeen days. Frequency counts of the moments of stuttering were taken based on a reading passage. The effect of adaptation to the reading passage was taken into account. Although they observed some decrease in stuttering frequency with the administration of lactose, no significant differences in stuttering frequency were evident for the three types of placebo.

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It is apparent from the foregoing that many psychological, and perhaps even physiological, reactions can arise from placebo administration. However, their use still appears to be essential in experimental studies with active drugs. Suggestibility and other psychological reactions that could occur with active drug administration would be taken into account by virtue of the reactions to the placebo control. The extent to which a placebo can produce positive responses can possibly be gauged by including a non-medication, non-placebo period during an experiment.

SECTION VIII - MEASUREMENTS AND RATINGS OF STUTTERING

Measurements of dimensions of stuttering behaviour are necessary when evaluating the changes that take place in the symptom. Stuttering varies greatly under certain known conditions (supra, Section II) but it can also vary for no apparent reason. Stutterers have reported that their stuttering comes and goes, often in cycles for no particular reason. The cause of the cyclic phenomenon in stuttering has been discussed by Quarrington (102) and others, but it has not been explained satisfactorily. The objective study of variability in stuttering is therefore difficult to make as any change that may occur may not necessarily be associated with manipulated conditions. Individual personality differences add to the problem of objective measurement in stuttering. However, these factors need not preclude our use of measurements - some attempt must be made to quantify data. This view is supported by Thurstone (122 p. 11) who states that:

... it is better to formulate the law of comparative judgements in terms of the discriminial error, which is a psychological concept, than to wait until we shall understand, physiologically, ...

Apart from the measurement of reading rate, few measurements for stuttering change can be applied completely objectively. Subjective standards and reactions on the part of an observer may interfere in the choice of the final criteria that may be applied to any particular aspect of the stuttering symptom.

The preponderance of literature pertaining to the

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measurement and ratings of stuttering comes from the University of Iowa. Subjectivity in observers of stuttering behaviour has been recognized by workers from this school and some attempt has been made to counteract the problem. The introduction of scales on which to rate symptoms of stuttering, together with the use of more than one judge for tests of reliability, has constituted a part of the development of objective measurements.

As the symptom and severity of stuttering vary so greatly from individual to individual, it appears necessary to apply an array of measurements in order to take into account all the possible facets. It is conceivable that one subject will stutter with equal severity in certain conditions, but with less frequency in the same conditions; the converse may also hold good.

A. Stuttering Criteria

The construct and application of measurements and ratings of stuttering must take into account a criterion of what constitutes stuttering. This becomes particularly important when differentiations must be made between the non-fluencies that can be detected in normal speakers and stutters. Johnson (65) has observed that "interjections, revisions, and phrase repetitions" can sometimes be considered as "normal" disfluencies. Bechmler (18) had indicated that two groups of judges (trained and untrained) classified part-word repetitions as "stuttering" as frequently for stutters as for non-stutters. The judges agreed more when stuttering was severe and when "normal" nonfluencies were mild. Williams and Kent (141) found that syllable repetitions and prolongations were more consistently identified as "stuttering" by judges. The results of their study showed the presence of different attitudes in the listeners towards different types of nonfluencies and they felt that these differences had theoretical and clinical implications.

Johnson (65) listed eight features of speech which he thought to be representative of disfluencies and this became known as the Iowa Speech Disfluency Test. Young (149) used a modified version of this test, and considered five rather than

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the eight features, in view of the rarity of occurrence of "phrase repetitions, incomplete phrases and broken words". His categories were:

- Interjections
- Part-word repetitions
- Word-phrase repetitions (where Johnson considered these as two separate features)
- Prolongations, including broken words (where Johnson considered these as two separate features)
- Revisions, including incomplete phrases (where Johnson considered these as two separate features)

Young (149) then used multiple correlation procedures to analyse the speech samples of stutterers as rated by listeners. As a result of these procedures he modified his categories further as follows:

- Syllable and sound repetitions
- Sound prolongations
- Broken words
- Words involving apparent unusual stress or tension

It would appear feasible to use the classification of the types of stuttering, as modified by Young, as a criterion of marking stuttering moments and rating the severity of stuttering. The writer would suggest the inclusion of word repetitions with "syllable and sound repetitions" as she feels that this feature occurs fairly frequently, especially on short words.

B. Severity Ratings of Stuttering

Various measurements can be applied to ascertain the severity of stuttering. Physiological changes can be noted such as alterations in breathing, heart rate, electrical skin response, etc. The duration of the stuttering moments can also be measured.

One satisfactory measurement of the severity of stuttering which has received some attention over recent years, is the use of an "equal-appearing intervals scale" to rate severity based on audible characteristics. Hurststone (122 p.185)

/lists ...

lists this type of scale as one of the classic psychophysical methods. The subject (or experimenter) sorts a number of stimuli into specified categories where the intervals appear to the experimenter to be equal. Thurstone points out that the experimenter need not actually succeed in making the intervals subjectively equal.

Sherman has done a great deal of work on severity scales, and together with Lewis (116), she first applied a nine-point scale consisting of equal-appearing intervals where 1 represented "least severe stuttering" and 9 represented "most severe stuttering". Fifteen judges rated speech samples on this scale and their judgements were found to be satisfactorily reliable. There was evidence that this severity scale had internal consistency. The scale was applied to permanent records (tape recordings) of the audible characteristics of stuttering. Sherman (114) then used the same scale to ascertain if observers could make reliable judgements of continuous stuttered speech. She demonstrated that this method is reliable, and is experimentally and clinically useful for assigning a rank order position of severity. Naylor (9) compared various measures of the severity of stuttering made by observers and the stutterers themselves. On the same scale as that used by Sherman, he found that the judgements of the severity of stuttering by trained observers had high agreement with the stutterers' evaluation of their own speech in the recording situation. In one aspect of a detailed study on the severity of stuttering, Young (149) found that the measurements of the severity of stuttering made on a rating scale of nine-point equal-appearing intervals by two groups of observers correlated highly and were significant.

Johnson (68 p. 281) suggests a seven-point equal-appearing intervals scale where he presents a description of the type of stuttering that each rating represents. Gullinan et al. (31) compared five-, seven-, and nine-point equal-appearing intervals scales and found that the scales were significantly correlated and that reliable values could be obtained from any one of these.

art from measures of the severity of stuttering, frequency with which stuttering occurs must contribute to the listener's evaluation of the severity of the symptom. This aspect was studied by Sherman and Trotter (117) who questioned the relationship between the frequency count of the moments of stuttering and measures of severity made on an equal-appearing intervals scale. From the data presented by eleven observers, they found that these two aspects were significantly and positively correlated, but they do point out that the relationship between the two measures is not strong enough to allow one measure to predict the other. Sherman et al. (118) compared three measures of stuttering severity; reading time; frequency moments of stuttering; and scale values from listeners' ratings. All interrelationships were found to be statistically significant and the strength of the relationship was highest between the frequency counts and the rated severity.

The visual characteristics of stuttering may be as important to measure as the audible characteristics when making severity ratings. It is difficult, however, to obtain such information for permanent records due to the expense of filming. It is necessary to establish nevertheless, how close or how far severity ratings based on audible characteristics only, differ from those based on visual and audible features. In this regard a recent detailed study was conducted by Williams et al., (142) who studied the ratings of stuttering by audio, visual and audiovisual cues making use of synchronized photography and sound recording. They found that the frequency count of stuttering and scale values representing severity are more reliable when obtained by audio and audiovisual observation than when obtained by visual observation. They suggested that the use of audio cues alone is sufficient for obtaining useful and reliable measures of the frequency and severity of stuttering. It is possible, the present writer feels, to consider the relative importance and influence of visual cues when marking the severity ratings of stuttering during the stutterers' act of reading, where audible cues would also be present apart from the visual characteristics. If the reading is recorded and played back at a later stage when the memory of the visual cues ceases to be influential, comparative data of ratings could

/ascertain ...

ascertain whether visual cues added significantly to the initial ratings of severity.

In a personal communication, Van Riper (132) pointed out that there is still no adequate way of measuring the severity of stuttering. He felt that the problem lies in the fact that stuttering is a compound of fear and struggle. He considered the use of physiological measurements to ascertain the severity of stuttering, as did the present writer, but suggested that these were subject to too many variables and would differ from subject to subject according to the nature of their symptoms. The use of physiological measurements, although theoretically plausible, were, for practical reasons, rejected for this study.

Johnson (63 p. 260) has said that the advantage of a severity rating scale with stutterers ensures a certain degree of uniformity and comparability of judgements. He cautions that such a rating can have its limitations and that clinical judgements of stutterers are still important.

A relevant point that can be considered here is the reliability of one observer to make severity ratings of stuttering. Cullinan et al. (31) found that judges tend to agree better with themselves than with other judges. Their evidence suggests that it is not sufficiently reliable to use a single judge on a single rating scale. It would seem feasible and convenient to employ a single observer to make severity ratings which can be compared with ratings made by a group of judges. This should indicate the kind of agreement among the judges and the reliability of the single observer's judgements. Sherman (115) studied this aspect by comparing individual observers and found, in contrast to Cullinan et al., that reliable scale values can be obtained from a single observer.

C. Frequency of Stuttering Moments

The frequency with which stuttering occurs contributes to the severity of the stuttering symptom. Like severity, frequency of stuttering can increase or decrease, depending on the tension and anxiety felt by the stutterer in communicative situations. The counting of stuttering moments constitutes a

/basic ...

basic measurement of the disorder. It is customary to have a subject read a passage and to mark the words stuttered on. It is also possible to count the frequency of stuttering during spontaneous speech where tape recordings can be transcribed and the moments marked and studied. As with the severity ratings of stuttering, visual cues exhibited by the stutterer can influence the experimenter's markings of the moments of stuttering while the subject is present and reading. Van Riper (133) suggested to the writer that the ratings (including frequency counts) should be made immediately following the reading and again after the playback of the recording. This, he said, would ensure the taking into account of the facial contortions and struggles which cause a short silent blocking to be misevaluated when heard from a tape recording.

Two important dimensions of stuttering behaviour are calculated on the basis of the frequency count - adaptation and the consistency effect.

Adaptation in stuttering is a well-known phenomenon where stuttering moments tend to decrease progressively with successive oral readings of the same passage. There appear to be individual differences, however, where some stutterers do not show any adaptation or may even produce increased stuttering with every reading (48 p. 268). Newman (97) very recently considered the possibility of classifying stutterers into groups on the basis of their adaptation performances. He re-examined data on adaptation and found that there were instances where subjects did not reveal any adaptation. The first study to note the phenomenon of adaptation in stuttering was conducted by Van Riper and Hull (135) in 1934. They attributed the decrease in the stuttering moments to the stutterer's subjective adaptation, either to the situation or to the reading material. Since then many studies have been published on this aspect and the general attitude appears to be that the stutterers experience less anxiety with each reading, thereby stuttering less. The time lapse following adaptation to spontaneous recovery of the original stuttering has received attention. Jamison (61) found that a four-hour and twenty-minute period was sufficient for complete recovery of the stuttering response to its original strength. Jones (73)

/found ...

found that adaptation was significant for five successive readings of the same material on the same day, and that after twenty-four hours following adaptation there was recovery of *stuttering to its original form*.

The consistency effect of stuttering was first noted by Johnson and Knott (69) who found a significant tendency for subjects to stutter on the same words from reading to reading of the same passage. Johnson et al. (68 pp. 272, 273) feel that the importance of knowing the consistency in stuttering is that it may indicate how strongly stuttering responses are associated with stimuli or cues that have been conditioned. The anticipation and expectancy of stuttering is closely related to the consistency effect.

D. Reading Rate

It has been commonly observed that stutterers take longer to read than non-stutterers. This time factor contributes to the severity of the problem. Sander (109) reported that reading rate was a highly stable measure of stuttering severity. He considered the relationship between reading rate and the frequency moments of stuttering, and concluded that the two measurements can be used as a tool for evaluating the speech improvement of stutterers. The computation of the reading rate in words per minute is outlined by Johnson et al. (68 p. 239). The number of words contained in a reading passage is divided by the number of seconds taken to read it and this is multiplied by sixty to convert the final rate to words per minute. This measurement, requiring only the use of a stop-watch, is perhaps one of the most objective methods of assessing any change in stuttering. The severity of the stuttering symptom, together with the frequency of its occurrence, will directly influence the rate of utterance.

E. Measurement of Anxiety

In a previous section of this Chapter the conflicting views on the nature of anxiety were presented and the methodological problems in assessing this aspect was discussed (supra, Section I). It has been put forward that the drug Amylozine

/may ...

may reduce anxiety thereby bringing about a reduction in the severity and frequency of stuttering. It was felt by the writer that it would be relevant to attempt a measurement of general anxiety for the purposes of the present experiment despite the uncertainty of the nature of anxiety itself. To the best knowledge of the writer, no tests are available that measure anxiety in relation to the attitudes and feelings of stutterers; therefore, a general test of anxiety had to be considered. A number of tests such as the Taylor Manifest Anxiety Scale (derived from the Minnesota Multiphasic Personality Inventory) and the Cattell 'PAT Anxiety Scale were considered, but rejected because these tests were designed for a single administration. The procedures involved in the assessment of the subjects in this experiment will be presented in detail in the following chapter, but it may be pointed out here that the subjects were seen on five different occasions at three-weekly intervals. It was felt that an anxiety test would lose its validity if administered five times. This problem of the re-application of an anxiety test was put forward to Cattell by the writer. Cattell (27) suggested that a measure could be constructed especially designed for stutterers on the basis of his Motivation Analysis Test where the "strength on the attitude" could be ascertained for the subjects. This appeared to be a major undertaking within itself, and in addition appeared to require a pilot-study run with a large sample, which was not possible at the time. Cattell advised the writer that a new scale, based on his IPAT Anxiety Scale, had just been published. This scale is the IPAT B-Parallel-form Anxiety Battery especially devised for successive administrations, by Scheier and Cattell (108).

Scheier (109) suggested that each of the eight test forms in the Anxiety Battery is a good measure of the anxiety factor and any single form is highly correlated with the other seven. The items are not repeated from test to test, which means that anxiety can be measured as frequently as is necessary without specious transfer effects. The anxiety factor, said Scheier (109) represents primarily the concept of free and situational anxiety. Scheier and Cattell (108 p. 1) define this anxiety in terms of a single factor-dimension,

/Independent ...

independent of all other personality dimensions, and which conforms to the consensus of clinical judgements as to what constitutes anxiety. They point out that this test should facilitate anxiety-fluctuation research, which had previously never been possible. Each of the eight forms contains fifty items, distributed over seven sub-tests of the questionnaire type. The sub-tests are untimed and are self-administered.

Bendig and Brauer (10) used this scale with forty-eight subjects with time intervals of two or seven days between the administration of the eight forms. They reported that the differences between the administration and the inter-actions did not appear significant for either sub-battery. Inspection of the means gave no evidence of consistent changes in scores between the scales for the time intervals.

SUMMARY OF CHAPTER

- I. Various interpretations of anxiety were put forward. It was described as the result of the expectation of trauma; apprehension; or uncertainty. Most authorities felt that anxiety is anticipatory in nature due to an apprehension of previously-fared experiences. The differentiation between the terms "anxiety" and "fear" was discussed by most writers. Contradictory results obtained from measurements of anxiety may be due to a lack of agreement in establishing and accepting a criterion of what constitutes anxiety.
- II. The role of anxiety in stuttering behaviour was discussed. A small group of writers believe that stuttering is a symptom and reaction to a basic anxiety, while the majority of workers feel that stuttering is the reaction to anxiety and fear. The terms "anticipation" and "avoidance" and the consistency with which they are used, indicate the presence of learned anxiety and fear which has become associated with the stutterer's poor speech performances. The reference to anxiety in stuttering appears to be based, in most cases, on clinical observations and impressions.
- III. States of anxiety in urbanized Africans in South Africa appear to be similar to those observed Europeans. The existence of stuttering among Africans has been established and basically appears to resemble the syndrome among European stutterers. Observations based on clinical experience with these subjects were given.

- IV. Studies on drug treatment with stutterers were reviewed. No conclusive result about any particular drug has been reported, although some studies indicate that the effects of drug treatment could be beneficial. Some clinical impressions appear to support the efficacy of drug treatment, but these impressions have not been borne out by statistics.
 - V. Drug treatment with urbanized Africans was briefly discussed. The Africans appear to react to tranquilizers in similar ways as European patients do.
 - VI. Results of studies indicate that trifluoperazine, amylbarbitone and the combination of these two drugs (Anylozine) are effective when used for anxiety and tension states.
 - VII. The use of the placebo in drug trials was discussed, and its "potent" effects described. Certain personality characteristics and attitudes towards the experimental situation tend to affect the type of placebo response.
 - VIII. Various measurements of stuttering behaviour were presented. The most descriptive and objective measurements appear to be severity ratings of stuttering, the frequency with which stuttering occurs, and the reading rate of stutterers. A measurement of anxiety that is to be used in the present study was described.
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CHAPTER III

METHODS AND PROCEDURE

SECTION I - THE AIM OF THE STUDY

The aim of this study is to note the effects of a combined mixture of tranquilizer and sedative (Amylozine) on adult stutterers. It is assumed that if any improvement in the symptom of stuttering takes place during the experimental period, this will be due to reduced anxiety brought about by the medication.

It is intended to study a number of aspects associated with stuttering change in as quantitative and objective a manner as possible. It is predicted, however, that such objective assessments may not always be truly reflective of the state of the stutterer at the time of examination, since it is known that, within one individual, fluctuation and variability of stuttering takes place. Empirical information will also be presented based on the stutterer's daily assessment of his speech, together with his own appraisal of the effects of the drug.

SECTION II - SUBJECTS

A. SELECTION OF SUBJECTS

European and African stutterers were selected if they were interested and willing to participate in the study. The names of European stutterers were provided by the Speech, Voice and Hearing Clinic, University of the Witwatersrand; the Johannesburg General Hospital's Speech Clinic; speech therapists in private practice; and in some cases, by private individuals.

/Five ...

Five African stutterers were referred by the Speech, Voice and Hearing Clinic, University of the Witwatersrand. In an attempt to obtain more African subjects, the writer surveyed eight African High Schools with the aid of a social worker who had spent many years in the African townships. Teachers were asked to select pupils whom they considered to be stutterers. Of the fifty pupils referred, eleven were regarded as being stutterers by this experimenter. Appointments were made with these eleven subjects to come into the Speech Clinic to interview the experimenter. On request, the Medical Officer of Health for Johannesburg issued a directive to Medical Officers in charge of clinics in the African townships which fall under the jurisdiction of the Johannesburg City Council. This directive explained the stuttering/drug study to be undertaken and requested that African stutterers be referred to the experimenter at the University of the Witwatersrand. No African stutterers were referred.

The stutterers were asked by letter to indicate their interest and willingness to take part in this study. The following information was included in the letter:

This investigation is intended to test the effect of a drug on your stuttering and will be under the supervision of Professor L.A. Hurst of Medical School, University of the Witwatersrand. The drug used will not interfere with your daily activities, it is regarded as safe and has been extensively used in the medical world.

Personal interviews were held with all those who indicated their interest in participating. During these interviews, the general purpose of the study was reiterated, the length of the experimental period explained, and the degree of their participation outlined. It was also made clear that the drug would not "cure" them of their stuttering.

At the time of these interviews, the selection of subjects was made, based on the following criteria:

1. That the stutterers were over the age of eighteen years.
2. That they considered themselves to be stutterers.
3. That the experimenter observed symptoms of

/non-fluency ...

fluency with the concomitant accompanying behavior of secondary stuttering.

The final selection of subjects after these interviews consisted of 93 Europeans (42 males and 5 females), and 17 Africans (14 males and 3 females).

Appointments were then made to see these subjects individually prior to the commencement of the experiment. This was in order to confirm future appointments, supply them with blank copies of the questionnaire, etc. The number of subjects who attended these appointments was reduced to 92 Europeans (36 males and 6 females), and 13 Africans (10 males and 3 females).

Those who defaulted totaled 10 (6 Europeans and 4 Africans). Of these, two European subjects informed the experimenter that they were leaving Johannesburg, and one European was eliminated as he reported that he was on daily Luminal administration for an epileptic condition. The remaining, 2 did not keep their appointments.

At various stages during the experimental period of fifteen weeks, 5 Europeans (males) and 4 Africans (2 males and 2 females) were eliminated from the study for the following reasons:

1. One European and 2 Africans did not keep their appointments during the first period of the study. They did not communicate with the experimenter when messages were left for them.
2. Two Europeans dropped out during the second and fourth periods of the study due to pending medical and accountancy examinations.
3. One African (female) was asked to recuse herself during the second period as it appeared that she did not understand the nature of the daily questionnaire, did not take her drug, and generally seemed confused.
4. One African (female) changed her place of employment

/during ...

during the third period of the study and was unable to keep the remaining appointments.

5. One European completed his daily schedule inconsistently and disturbed the drug/placebo routine. He did not take most of the medication during the second period. Instead of returning the unused Spansules, as was requested of everyone, he placed them in a container together with the medication received during the fourth period. He thus mixed the placebo and drug allocation.
6. One European took his medications regularly and attended his five appointments, but he did not complete more than fourteen daily schedules out of a possible one-hundred and five.

Alterations in appointments for certain individuals and special arrangements concerning the supply of the medication had to be made. This was due to short-term illnesses, mild accidents, domestic interruptions and to the fact that some subjects had to spend short periods in the country due to the nature of their employment.

TOTAL NUMBER OF SUBJECTS COMPLETING THE EXPERIMENT:

<u>Europeans:</u>	37	-	(31 males, 6 females)
<u>Africans:</u>	9	-	(8 males, 1 female)

Previous therapy:

The majority of subjects had received various forms of speech therapy at some stage in their lives before this study took place. A few subjects had also received some form of psychotherapy. Of the total group, two Europeans reported that they had never received any type of therapy for their speech. Five of the Africans had received previous speech therapy. The remaining four had apparently never received any attention for their speech.

Those cases receiving therapy prior to the experiment, which commenced in March, 1963, had all stopped therapy before the vacation period, December 1962 - January 1963.

/They ...

They did not continue with therapy until the completion of the experiment in June, 1963.

One European subject who was doing a course in progressive relaxation and one European who had been taking Librium ceased their respective treatments two weeks before the commencement of the experiment.

B. AGE OF SUBJECTS

EUROPEANS

The European subjects ranged in age from 18 years 2 months to 50 years 6 months.

As from the 1st March, 1963, the mean age for 37 subjects was: 26 years 6 months

Tables 1 and 2 represent the age groupings of the European and African subjects.

TABLE 1
Number, percentage and sex of European subjects
falling into the various age intervals

Age	Number European Subjects	Percentage of Group	Number Males	Number Females
18 - 19	11	29.73	8	3
20 - 21	5	13.51	5	
22 - 23	5	13.51	4	1
24 - 25	2	5.40	2	
26 - 27	2	5.40	2	
28 - 29	3	8.11	3	
30 - 31				
32 - 33	2	5.40	1	1
34 - 35				
36 - 37	1	2.70	1	
38 - 39	2	5.40	2	
40 - 41	2	5.40	1	1
42 - 43				
44 - 45				
46 - 47				
48 - 49				
50 - 51	2	5.40	2	
TOTALS	37	99.96	31	6

/ AFRICANS ...

AFRICANS

The African subjects ranged in age from 18 years 2 months to 24 years.

As from the 1st March, 1963, the mean age for 5 subjects was: 20 years 1 month

TABLE 2

Number, percentage and sex of African subjects
falling into the various age intervals

Age	Number African Subjects	Percentage of Group	Number Males	Number Females
18 - 19	4	44.44	4	
20 - 21	2	22.22	1	1
22 - 23	3	33.33	3	
TOTALS	9	99.99	8	1

SECTION III - PHARMACEUTICALS AND ADMINISTRATION

The supplier of the drug and placebo was Smith Kline and French Laboratories (Pty) Ltd.

A. DRUG

The drug selected for this trial was Amylozine. This consists of a combination of 2 mg. trifluoperazine (tranquillizer, trade-name "Stelazine"), and 65 mg. (gr. 1) amylobarbitone (barbiturate). This combination was presented in "Spansule" form which is a sustained-release capsule providing a plateau-effect maintained over twelve hours. The Spansule is a proprietary item of manufacture by Smith Kline and French Laboratories (Pty) Ltd.

B. PLACEBO

A control capsule visibly identical with the one containing the drug was used. The placebo capsule weighed

234.7 mg. ...

234.7 mg., and was made up of Sucrose 137 mg., inorganic substances, 15.2 mg., and starch and other organic matter, 79 mg.

C. DOSAGE

Each subject was given a weekly supply of 14 Spansules, containing either the drug or placebo, and was instructed to take two daily, the first after breakfast, and the second twelve hours later at approximately supper-time.

The dosage remained constant throughout the medication periods. At first it was thought advisable to alter the dosage according to the individual needs of the subjects. This however was found to be impractical due mainly to the nature of the Spansules which were prepared in England. In addition, alteration of dosage could possibly have caused awareness on the part of the subjects that the medication was being manipulated. Any manipulation of the placebo, particularly if administered during the first period of medication, would not have been practical.

D. SCHEME OF PRESENTATION

The Spansules containing either the drug or placebo were prepared in England by Smith Kline and French Laboratories (Pty) Ltd., on behalf of their branch in Johannesburg. The Spansules (containing drug or placebo) were packed in identical containers. The Medical Adviser on the staff of the Laboratories was given the list of subjects by the experimenter. He divided the subjects into two groups according to a set of random numbers. One group was to receive the drug first and the second group the placebo first. These groups were switched around for the second period of medication. The European and African subjects were treated separately as two distinctive groups. The names of the subjects were written on the containers by the Medical Adviser, who delivered them to the doctor administering the drugs to the subjects. The first batch was delivered before the second period of the experiment, and the second batch was delivered before the fourth period of the experiment. These containers consisted of a weekly supply of either drug or placebo. Three lots of

/containers ...

containers for each subject comprised each batch delivered.

The code representing the assigned allocation of either drug or placebo was made known only to the doctor administering the drug to the subjects. A duplicate copy, that was to be used only in the case of an emergency, was left by the firm with one of the Supervisors of this dissertation (Mrs. S. Bauman, Department of Logopedics, University of the Witwatersrand). This copy remained unopened until the completion of the experiment. The code was finally made known to the experimenter one and a half months after the completion of the study, when all the raw data had been collected and prepared for statistical analysis.

E. MEDICAL SUPERVISION

The drugs were administered to the subjects by a doctor on the psychiatric staff of the Johannesburg General Hospital. Arrangements were made for him to meet the subjects a day before the first medication period. He met the subjects in five separate groups (three groups of Europeans and two groups of Africans). The grouping of the subjects was according to time-convenience only and this arrangement was maintained for the duration of the experiment. The European subjects were seen in the Conference Room in the Department of Psychiatry, University of the Witwatersrand, and the African subjects were seen at the Johannesburg Non-European Hospital.

The doctor administering the drug addressed each group at their first meeting which was held a day before the medication commenced. The purposes of the meeting were as follows:

1. To ascertain that all the subjects had stopped any form of therapy (psychotherapy, speech therapy, drugs, etc.) The subjects were told that they could meet the doctor after the meeting should they want to discuss any matter which they considered private. (No one took advantage of this).
2. To check if any subject was suffering from any

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form of illness where medication was prescribed.
No subjects reported any type of illness.

3. As a precautionary measure, the subjects were asked not to discuss their reactions to the study or the drug with each other.
4. The subjects were asked to notify the doctor of any illness that might occur during the experimental period where medication would be prescribed by their doctors. At this stage the subjects were reassured about the safety of the drug, but it was pointed out that for scientific reasons concerning the nature of this study, it would be important to know if any prescribed medication was given during the trial.
5. The administration of the drug, in terms of the organization of the periods of the study, was explained to the subjects. This was a reiteration of what the experimenter had outlined to each subject before the study began.
6. They were reminded to complete their daily schedules every evening and to indicate on these sheets whether they had remembered to take the drug.
7. The subjects were asked to contact the doctor or the experimenter immediately should they not be able to keep appointments.
8. The subjects were told that the success of the study depended very largely on their participation and that such scientific investigations could only be made possible by their generosity concerning their time and co-operation.

SECTION IV - BASIC EXPERIMENTAL DESIGN

When this study was first contemplated the use of two drugs was considered - "Stelazine" (Trifluoperazine) and "Cesedat" (Allyl Neopentyl Barbituric acid). The design of the experiment at this stage differed markedly from the procedure finally adopted. It may be of interest to discuss here the original design and its disadvantages before presenting

/the ...

the final experimental procedure as used in this present study.

Two variables - sex of subject and the severity of the stuttering symptom, were considered in the initial design, and in view of this a 2^4 factorial design with randomized blocks was devised. It was thought that such a design would allow for all main effects (drugs, placebo, period of non-medication, sex and severity of stuttering). Their interactions would be isolated in the final analysis. Each block would have consisted of sixteen subjects (or multiples of four) and at least four such blocks were necessary for a reasonable number of error degrees of freedom. The design would have taken the following appearance before randomization:

	Male <u>Severe</u>	Male <u>Mild</u>	Female <u>Severe</u>	Female <u>Mild</u>
1	no med.	no med.	no med.	no med.
2	S	S	S	S
3	C	C	C	C
4	P	P	P	P

(S - Stelazine; C - Censodal; P - placebo;
no med. - no medication).

This design was abandoned for the following reasons:

1. At the time it was not possible to find sufficient stutterers - at least sixty-four were required for this design.
2. As many female stutterers were required as male stutterers. In view of the known ratio (14 pp.20,21) of male stutterers to female stutterers (approximately 4 : 1) this would have been almost impossible.
3. The block design demanded that the subjects remain in attendance throughout the study. It was feasible to expect a number to fall out during the trial.
4. Initially it was thought necessary to have severity of stuttering as a variable since it was possible that different reactions to the drug might be related to the degree of the severity of stuttering. The

/severity ...

severity variable was eliminated as it was thought necessary to assess this aspect of stuttering itself in order to measure possible changes due to medication. It became clear that a stuttering group could not be compared as a whole in any great detail because of the very diversity of the stuttering symptoms and background of the individuals.

5. The existence of Amylozine was made known to the experimenter after the above design had been contemplated. This drug seemed to offer interesting possibilities since it has the combined properties of a tranquillizer and a sedative - each acting on different parts of the central nervous system. In addition it was felt that the use of one combined drug would permit the design to be more simple and accommodating as well as involving the subjects in a shorter experimental period.

In the final experimental design chosen, one drug (Amylozine) and placebo were used. The European and African subjects were treated as two completely separate groups. Subjects from each of these groups were randomly assigned to two sub-groups where half commenced on the drug first, and the other half on the placebo. These treatments were then crossed. In this way the subjects acted as their own controls, and this eliminated some of the problems encountered when matching groups. A further advantage of this cross-over method is that it takes into account the sequential order of the presentation of the drug or placebo, a point considered important by Nash (94 p. 132). No variables were considered when the subjects were assigned to their groups. The randomization of the subjects was undertaken by the Medical Adviser of Smith Kline and French Laboratories (Pty) Ltd. The application of a criterion for the selection of the subjects has been discussed in Section II.

The double-blind experimental technique was utilized in that neither subjects nor the experimenter knew of the drug or placebo allocation. The subjects themselves were unaware of the fact that a placebo was being used. They were under

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the depression that the drug could be administered twice during the experimental period with a three-week break between each medication.

The study extended over fifteen weeks. This was divided into five periods of three weeks each. A period of three weeks was chosen in order to allow for any carry-over effects to diminish. It also provided sufficient time to allow for a good average response to the drug, placebo or non-medication periods. Originally four periods of three weeks each were considered, but it was later suggested by Dr. Van Riper (133) that a final three-week period of non-medication should be included because of the "halo effect of participating in an experiment". This would afford the opportunity of comparing three non-medication periods - prior to medication, during periods of medication, and a final period at the close of the study. It is conceivable that each of these non-medication periods carries its own psychological "atmosphere" which will have to be taken into account when reviewing the final results of the study. The writer realizes that it would be virtually impossible to consider objectively the way each period of the experiment would be perceived by individual subjects. It must suffice to say that we are aware that psychological attitudes to the stages of the experiment and the experience as a whole, can occur.

The outline of the five periods of the study is as follows:

- 1st period - three weeks - no medication
- 2nd period - three weeks - drug or placebo
- 3rd period - three weeks - no medication
- 4th period - three weeks - placebo or drug
- 5th period - three weeks - no medication

SECTION V - MEASUREMENTS AND ASSESSMENTS

A. PERSONALITY INVENTORY

During the month preceding the experimental period, European subjects were administered the Minnesota Multiphasic Personality Inventory. This inventory is designed to provide

/scores ...

scores on the more important phases of personality and in particular, to provide an estimate of symptomatic syndromes commonly recognized among persons with clinical problems (56 p. 22). The MMPI is a well-known validated test that has become an essential clinical tool.

It would be pertinent to ascertain whether any particular type of personality responds positively to the drug. For the purposes of this study the categories of improvement derived from the verbatim reports will be compared to the individual scores obtained for the various scales of the MMPI. Parker (99) suggested to the writer that, as there was no normative data for the Inventory in this country, the scores derived should be used as dependent variables where identifiable personality characteristics can be assessed rather than to define diagnostic groups. He also recommended that the comparisons should be statistical, not impressionistic.

The Inventory was given to the subjects in the form of a booklet which contained 566 items. This contains sixteen more items than the customary card-form presentation of the Inventory. These items are duplicates, and were included in the booklet and on the answer sheets to allow for scoring by machines as well as by hand. The instructions to the subjects were printed on the front of the booklet. Responses were marked "true" or "false" on a separate answer sheet. These answer sheets were scored by hand using keys provided for each scale. The raw scores were plotted on printed profiles which contained the standard scores. Although this form of the Inventory is designed to be administered to groups for convenience, it was presented individually to the subjects in this study. The subjects were left alone to complete the Inventory.

B. THREE-WEEKLY MEASUREMENTS AND ASSESSMENTS

(1) Introductory Comments

A number of testing procedures was administered to subjects individually once in three weeks. These assessment-interviews took place in an office at the Speech, Voice and Hearing Clinic, University of the Witwatersrand. All subjects

/were ...

were seen for a period of approximately forty-five minutes. The purpose of these three-weekly assessment-interviews was to collect data pertaining to various aspects of the subjects' stuttering, where such data might indicate changes due to medication.

From the outset, the experimenter was aware that a speech assessment for a stutterer conducted once in three weeks, would not necessarily provide data which would be a true reflection of the stutterer's state for the whole of this period. Stuttering can vary a great deal within the same individual and it was conceivable to expect that a subject might produce worse stuttering on one or two days within a period of otherwise improved speech - the converse may also hold good. Assessments conducted twice in three weeks would still not counteract this problem. Further, it would have been difficult to see forty-six subjects more frequently due to the following:

1. Interviews with subjects were clustered around the mid-period of each three weeks. This was done in order, either to counteract possible carry-over effects from previous periods, or to allow time for the drug or placebo reaction to be felt during medication periods.
2. At the same time it would have been extremely difficult to arrange two interviews with forty-six subjects. The majority of subjects were attending lectures at the University or were in full-time employment and thus could only attend late afternoon appointments. Some were able to come during their lunch hours or over the week-ends.
3. It was expected that a number of subjects would not be able to keep their appointments because of minor hindrances, e.g. University class tests, domestic problems, employment demands. As a result the possibility of postponed appointments had to be borne in mind when drawing up the schedule.

The appointments for the three-weekly assessments were

/made ...

made with the subjects before the experiment began. An attempt was made to keep these appointments constant - i.e. subjects were to be seen at the same time on the same day of the week at three-weekly intervals. Where appointments could not be kept, due to transport difficulties, demands of employment, etc., the subjects' appointments were made for different days of the week but at the usual time of the day. This arrangement was made since it was felt that certain moods or tiredness might occur at particular times of the day for individual subjects. Due to the relaxation associated with weekends, no postponed appointments were made for this time for those subjects normally seen during the week. Similarly, postponed appointments for subjects normally seen at weekends were made for the following week end, not for a week day. The first appointments were made from the sixth day after the commencement of each period.

Due to employment difficulties, a small group of stutterers could only attend appointments on Saturdays and Sundays. Consequently they could only see the doctor to receive their drug at these times. As a result of this, the subjects were divided into two main groups - those receiving their medication on Wednesdays (at lunch time or at five-thirty in the afternoon), and those receiving the medication on Saturdays at midday. The dates of the commencement and completion of the study differed for the subjects according to their group meetings with the doctor. The dates were as follows:

29 Europeans and 6 Africans commenced the study on Thursday, 7th March, 1963 and completed it on Wednesday, 19th June, 1963.

8 Europeans and 3 Africans commenced the study on Sunday, 10th March, 1963 and completed it on Saturday, 22nd June, 1963.

(ii) Stuttering Criteria

The experimenter's ratings of the severity of stuttering and the frequency count of the stuttering moments, were made according to a criterion of what constituted stuttering

/behaviour ...

behaviour. The criterion used follows Young's categories (1943) and is as follows:

- Syllable, sound and word repetitions (including part-word repetitions)
- Sound prolongations
- Broken words (i.e. broken utterances)
- Words involving apparent unusual stress or tension

(iii) Reading Passage

The passage utilized at the three-weekly interviews was a slight modification of a portion of the "Rainbow" passage by Fairbanks (36 p. 168). The passage was modified so that it could be divided into two sections - the first part consisting of 200 words, and the second part of 110 words. A copy of the passage as used in this study may be found in Appendix A. During the first three assessment periods only the 200-word passage was presented, and during the last two assessment periods the complete 310-word passage was given to the subjects. The extra 110-word passage was included during the last two periods, in order to ascertain whether any adaptation to the same passage (first 200 words) had occurred. Thus the 110-word passage, as the non-adaptation passage, acted as a control. Any progressive improvement in reading during the course of the experimental period may be due to this adaptation taking place, rather than due to the effects of medication. The instruction to the subjects, when asked to read the passage, was: "Please read this passage aloud as you normally would".

The same passage with the same scheme of presentation was given to the African subjects. Although English is their second or even third acquired language, it had been established during the initial interviews that they were all conversant with English. The African subjects were all attending high-school where they were required to know this language. It would, perhaps, have been more appropriate to have selected passages in the various Bantu languages, but two problems arose. Firstly, a great deal of work would have had to be done to construct passages that were relatively balanced in some of the Bantu languages (e.g. Zulu, Xhosa). Secondly, neither the judges who were to rate samples of tape recordings nor the experimenters were familiar with the Bantu languages.

/Despite ...

despite the possible difficulties that some African subjects might have had with English, it was felt that the information on change of speech performance from one period to another, was the essential issue, rather than facility of language.

(iv) Ratings and Assessments

These were made five times, once in every three weeks for individual subjects. Eleven items were considered:

1. Experimenter's severity rating of stuttering on subjects' reading.
2. Experimenter's severity rating of stuttering on the first playback of the tape recording of the reading.
3. Experimenter's severity rating of stuttering on the second playback of the recording of the reading.
4. Experimenter's severity rating of stuttering on subjects' spontaneous conversation.
5. Subjects' severity rating of their own stuttering on reading.
6. Subjects' severity rating of their own stuttering on the first playback of the recording of the reading.
7. Frequency count of stuttering moments during the subjects' reading.
8. Frequency count of stuttering moments taken during the first playback of the recording of the reading.
9. Reading rate measured in words per minute.
10. Subjects' severity rating of stuttering for the same day, prior to the assessment-interview.
11. Administration of the IPAT 8-Parallel-Form Anxiety Battery.

During each of these five assessment-periods, the subjects were asked to comment on their speech and the effects that they thought the drug might be having on them. These comments were written down, and formed the *verbatim reports*

(which ...

which will be discussed in Section V (C).

DETAILS OF THE ABOVE FACTORS

Due to the nature of many of the measurements taken, certain aspects concerning the procedure of the experiment will be included here. The overall description of the procedure of the entire experiment will be discussed in Section VI.

1. Experimenter's Severity Rating of Stuttering on Subjects' Reading

The rating of the severity of stuttering was made by the experimenter after the subject had read the passage. The rating was made on a nine-point equal-appearing intervals scale where "1" represented no stuttering, "9" very severe stuttering, and "5" represented average stuttering. The other points on this scale represent values falling between these points. This type of equal-appearing intervals scale was first introduced by Thurstone and Chave (121).

The rating was made by the experimenter immediately after the subject had completed his reading. A number representing the rating was written on top of a copy of the reading passage that was placed in front of the experimenter, on which the frequency count of stuttering had just been made. This was obscured from the view of the subject, who was unaware that such a rating was being made.

2. Experimenter's Severity Rating of Stuttering on the First Playback of the Tape Recording of the Reading

A rating on the same scale as described above was made when the tape-recording of the reading was played back. This was done after the subject had left the experimenter, on the same day of the recording. The experimenter did not refer to the first rating made. This second rating was necessary since it was possible that visual cues displayed by the subjects during the reading might have affected the first severity rating made by the experimenter.

/3. ...

3. Experimenter's Severity Rating of Stuttering on the Second Playback of the Recording of the Reading

On the same scale as described above (1) a severity rating was made when the tape-recording was played back approximately ten days after the initial reading. Again this rating was made on a separate sheet without reference to the first two ratings.

This third rating was considered essential. The first rating could possibly have been influenced by the presence of visible characteristics displayed by the stutterer during the reading, and the second rating, following on after a short interval, might have been similarly affected due to the recall of overt struggle reactions. Therefore this third rating, made ten days later, was based predominantly on auditory characteristics. The third rating was considered a crucial one, in that samples of tape-recordings were to be played afterwards to judges who would react only to these auditory cues, thus making comparative data possible.

4. Experimenter's Severity Rating of Stuttering on Subjects' Spontaneous Conversation

A rating representing the severity of the subjects' stuttering in spontaneous speech, was made on the same nine-point equal-appearing intervals scale described above. Some spontaneous conversation took place when the subjects first arrived for the interview. At the end of the interview, if the information was not volunteered in enough detail, the subjects were asked to comment on their speech, the drug effects, and on the study as a whole. This rating was made separately from the readings as it was felt that with many stutterers, there is a marked disparity between the amount of stuttering in reading and in spontaneous speech performances. No attempt was made to structure the conversation and no tape recording was made.

5. Subjects' Severity Rating of their own Stuttering on Reading

After a subject had read the passage he was asked to rate himself on the same scale used in the above measurements. The instruction to the subject was as follows:

/On ...

On the following scale, rate your stuttering
on the passage you have just read.

1	2	3	4	5	6	7	8	9
No				Average				Very
Stuttering				Stuttering				Severe
								Stuttering

It is conceivable that a subject will rate himself differently from the experimenter due to subjective feelings about his problem. In view of this it was thought that any effect that the drug might be having, would influence the way a subject perceived his performance, irrespective of any possible change in performance.

6. Subjects' Severity Rating of their own Stuttering on a Playback of the Recording of the Reading

Approximately thirty minutes after the subject had recorded the reading passage, he was asked to hear the tape recording and to rate himself on the same scale. The instruction to the subject was:

The reading you have just made will be played back to you. Listen to it and rate your stuttering on the following scale:

1	2	3	4	5	6	7	8	9
No				Average				Very
Stuttering				Stuttering				Severe
								Stuttering

It was felt that the confrontation of hearing their speech might change their judgement of the severity which they had previously made on their reading. It is expected that, due to poor attitudes towards speech, the subjects would make a slightly higher rating than previously. This information could be valuable for comparative purposes, in terms of self-judgements of the severity of stuttering based on the same material judged under different conditions.

7. Frequency Count of Stuttering Moments during the Subjects' Reading

While the subject read, the experimenter marked on a copy of the reading passage, the words on which stuttering

occurred . .

occurred. The criteria of what constituted stuttering moments has been discussed earlier in this section (part II). Later these marked words were counted and the total taken as the frequency count of stuttering. During the last two periods of the study, when the additional 110-word passage was introduced together with the familiar 200-word passage, the frequency count was taken separately for both passages. This was in order to provide a control test for any possible adaptation which might take place. For example, the figures for the first period and the fourth period might have been written as follows:

Period 1	Period 4
$\frac{40}{200}$	$\frac{33}{200} + \frac{18}{110} = \frac{51}{310}$

As with the severity of the symptom, the frequency with which it occurs may vary according to the stress experienced in speaking situations. The frequency of stuttering also contributes to the severity of the problem.

8. Frequency Count of Stuttering Moments taken During the First Playback of the Recording of the Reading

The tape-recording of the reading was played back later during the same day of the recording. The frequency count was marked on a copy of the reading passage. No reference was made to the markings on the first copy of the passage.

This aspect was considered twice since it is possible that visual cues representing struggle responses, especially those associated with non-vocalized blocks, would be noticed during the reading when the subject was present. It can be expected, therefore, that the frequency of stuttering is greater when taken during reading as compared with the count taken on the playback of the recording. This second count was considered necessary as samples of the recordings were to be played to judges who would only respond to the audible characteristics of the symptom.

9. Reading Rate Measured in Words per Minute

When the tape-recordings were played back during the same day of the readings, they were timed with a stop-watch. The reading rate was calculated according to the number of words contained in the passage (either 200 or 310 words), divided by the time in seconds that a subject took to read the passage, and multiplied by sixty, to convert the answer to words per minute.

As discussed in the previous chapter, reading rate is probably the most objective dimension of stuttering behaviour, since it does not rely on any subjective evaluation made by an experimenter. The amount of stuttering moments (frequency) and the severity with which stuttering occurs, will directly influence the time it takes a stutterer to read.

10. Subjects' Severity Rating of Stuttering for the Same Day, Prior to the Assessment-Interview

The subjects were asked to rate their stuttering as it was for the same day, prior to the interview. The question was put to them in this way: "What was your speech like today before coming here? Was it the same as usual, slightly better, much better, slightly worse, much worse?" This question was very familiar to them as it followed the same format as the daily schedule questions which they were completing. Their answer was rated by the experimenter on the following scale:

Much Better	Slightly better	Same	Slightly worse	Much worse
1	2	3	4	5

This rating was made as it was felt that the interview situation might have been perceived as being tense by some subjects, and the likelihood might arise that their speech symptoms, during the interview, might have been worse than the speech produced during the day, before coming to the Clinic. Often their discussion on this aspect added to the contents of the verbatim material.

At the same time the subjects were asked to comment
/on ...

on the "usualness" or "unusualness" of the day they had just experienced. This question was asked in order to elicit information as to whether anything untoward had occurred that could possibly affect their speech symptom.

11. Administration of the IPAT B-Parallel-Form Anxiety Battery

Subjects were asked to complete one form of this Battery which consists of seven sub-tests. They completed one form on every visit after making the recording of the reading. The test has been described in the previous chapter (supra, Section VIII).

Enquiries were made at the National Institute for Personnel Research, Johannesburg, if any form of personality test (which included an anxiety component) existed for Africans. Apparently none exists. Only European subjects received the Anxiety Battery in this experiment.

Eight forms are available with the IPAT Battery, but five were chosen - one form for each of the five three-weekly assessments. The authors of this test (108 p. 2) suggest that stability of measurement can be improved by choosing only the forms with the best correlations. The forms thus chosen were: A, B, D, F, G. The following table taken from the Handbook of the Battery (108 p. 2) indicates the correlations with the anxiety factor for the eight forms.

<u>FORM</u>	<u>CONSTRUCT VALIDITY:</u> Correlation with <u>Anxiety Factor</u> *
A	+ .56
B	+ .54
C	+ .53
D	+ .64
E	+ .51
F	+ .68
G	+ .53
H	+ .50

* Pearson product-moment correlation coefficients.

/As ...

As an example of this Battery, form A is reproduced in appendix B.

It must be pointed out that this Battery is relatively new and has not yet been substantiated by many workers. In addition it is not certain whether the type of anxiety as measured in this test, is the same in content or similar to the type of anxiety felt by stutterers generally, or even specifically, in terms of stressful situations involving communication. Nevertheless this Battery was chosen since it is the first available of its kind, where different forms can be used for successive administrations.

C. VERBATIM REPORTS

The subjects were asked to comment on their speech generally, as applicable to the three-week period since they had last been seen. In the case of the first interview they were asked to comment on their speech since they had commenced marking their daily schedules - this was approximately one week before they were seen for the first time. Where subjects did not volunteer freely on this topic, questions such as the following were asked: "do you feel any effect from the drug?", or "do you feel that your speech is more or less the same as before you started the study, or is there any change?" Lengthy discussions were held, where the subjects remarked on their general feelings towards their speech, the study itself, the drug and other relevant aspects. The experimenter spoke as little as possible and attempted to refrain from asking leading questions. The remarks made by the subjects were written down quickly in a form of shorthand by the experimenter. The paper on which the remarks were written was obscured from the view of the subject by a large tape-recorder on the desk, but no attempt was made to hide the fact that the experimenter was writing. The remarks made by the subjects were read back to confirm their contents. The tape recorder was deliberately not used for this information as it was felt that the subjects would be under strain if they knew their comments were being recorded. Although the situation was semi-structured in terms of obtaining information, the

/experimenter ...

experimenter tried to keep the general atmosphere as casual and relaxed as possible.

Before the completion of the experiment and after all the last interviews had taken place, the subjects were requested to write a summarised account of their attitudes and feelings towards the study, the drug effects, their speech in terms of any change and any other aspect they considered relevant. These summaries were incorporated into the final transcript of the verbatim reports.

The information obtained from the verbatim reports constitutes an important facet of this study. Irrespective of the type of data obtained from the three-weekly assessments and the daily schedules, the subjects' own comments are considered valuable in terms of the drug effects. Lehman (82 p. 116) believes that introspective reports, where a person's awareness of his own state of learning and feelings are expressed, must be recognized as a kind of observation and a legitimate source of knowledge. Grent (76) concluded, after reviewing studies on the effects of drugs on stuttering, that changes that have been interpreted as favourable, have in the main been based on subjective reports where there has been a lack of significant statistical data.

Statistics can lose sight of the human response, and as we are concerned with stutterers seeking therapeutic and adjustment point of view, their comments about how they feel must be seen as being highly relevant. The suggestion alone plays a part in causing a subject to believe that he is experiencing beneficial results from a drug, then his own estimation of improvement becomes essential and realistic, irrespective of whether or not objective criteria support his evaluation of his improvement.

An attempt was made to categorize reported effects of the drug as contained in the verbatim material. The verbatim reports were scrutinized and an overall estimate of change in speech in terms of the drug and placebo was made according to: "worse"; "no change"; "slight

/improvement ...

"improvement"; and "much improvement". This type of categorization is one which appears very frequently in medical and psychiatric publications concerning the effects of drugs on behaviour. Four judges, who represented part of the staff at the Speech, Voice and Hearing Clinic, categorized the verbatim reports, using the same procedure as the experimenter, but these judges were not made aware of the experimenter's initial evaluation. Where total agreement did not exist about any particular set of reports, a discussion was held until the majority agreed on a particular category. These judgements were compared with the experimenter's and again when there was any disagreement, the final judgement was made after discussion between the experimenter and the judges. In this way some attempt was made to obtain relatively objective data of the estimates of the drug and placebo effects based on the verbatim reports.

D. DAILY SCHEDULE

As explained above (*supra*, Section IV B), the testing procedures could only be conducted once in three weeks. The aim of these procedures was to collect data which would possibly indicate the stutterers' reactions to medication. Although it was necessary to administer these evaluating procedures in an attempt to collect such data, it was realised that one interview with a stutterer in three weeks could hardly elicit sufficiently reliable information that would reflect any consistent change in symptomatology or attitude. Stuttering is known to fluctuate a great deal, even during the course of one day. Some stutterers report that improved mood or circumstance has a direct improving influence on their speech, while others report that they cannot attribute any improvement or regression in their speech to change of mood or circumstance.

A further point concerning the disadvantage of measurements taken at three-weekly intervals, is that the interview itself represents an unnatural situation. The stutterer is attending a speech clinic (a permissive atmosphere to some) and at the same time his speech is being

/tested ...

tested and recorded (tension-provoking to some stutterers who are made more aware of their speech problem). It is therefore likely that the stutterer's speech performance or any feelings of worry or anxiety (either general or associated with their speech) is not necessarily consistent, at the time of the interview, with the period which it represents. Lastly, it is inevitable to expect that events could occur immediately before an interview, which could possibly affect the subject, thereby influencing his speech - e.g. running out of petrol, an unrewarding day at the office, good class-test results. Nevertheless, as has been discussed, the three-weekly system of assessments was still necessary in order to make some attempt to gauge stuttering change in objective terms using dimensions of stuttering behaviour.

An additional system of measurement was adopted in an attempt to counteract the limitations of the assessment-interview period held once in three weeks. This involved the construction of a schedule of questions that the subjects were asked to complete daily for the duration of the experiment (105 days). This schedule or questionnaire was designed in such a way as to obtain scores (ratings) that would reflect possible changes in aspects associated with the stuttering problem, such as avoidance of stuttering, attitudes towards speaking situations, etc. It was hoped that such a schedule would provide data that would reflect the "average" state of the stuttering symptom together with the associated attitudes. As there were three periods of non-medication, it is reasonable to expect that a comparison of the average response for each of these periods could be made with the average response to each of the medication periods (drug and placebo). By this method added information might become available as to the effects of a drug on stuttering, as perceived by the subjects themselves.

Most of the points covered by the schedule concern those component parts of the stuttering phenomenon that can undergo change. The choice of these aspects has been largely influenced by the experimenter's experience with stutterers while conducting therapy, as well as by the literature on the subject. In addition to the selection of aspects specifically

/related ...

related to stuttering, questions pertaining to the anxiety experienced by stutterers in speaking situations were considered.

As this schedule is original in construction, a pilot study was carried out in December, 1962, where it was submitted to eight adult/teenage stutterers who completed them daily for twenty-one days. These subjects did not participate in the final study. Many changes were made in the format and composition of the schedule, and questions were re-framed or eliminated.

The revised and final schedule consists of fourteen questions: a stuttering and mood chart for various times of the day; a rating scale of stuttering for the day; and a question relating to the usualness or unusualness of the day. The final schedule as completed by the subjects can be found in Appendix C.

The aspects associated with the stuttering problem that were considered in this schedule, are outlined below. The numbers in parentheses refer to the number of the question as it appears on the printed sheet.

- General rating of stuttering (1, and a separate rating at the end of the sheet)
- Word and situational avoidance (2, 5, 7, 9)
- Word and situational anxiety (6, 8, 10)
- General anxiety, fear and tension about speech (3, 11, 13, 14)
- Effect of drug on stuttering and feelings (4, 12)

Many of the questions are repeated in different forms, e.g. questions 2, 5, 9. This was intended to ascertain the consistency of response, and also to prevent the schedule from being filled in automatically by the subjects. Questions 4 and 12 were only answered during the medication periods, i.e. during the second and fourth periods of the study. The subjects were instructed to omit these during the other periods.

Stuttering is known to fluctuate during the course of a day. For example the tiredness experienced at the end of the day or even in the early morning could increase or

/decrease ...

decrease the amount of stuttering. In order to detect any overall changes that might occur, a chart was constructed depicting the five periods of a day: early morning, noon, afternoon, late afternoon, evening. The subjects were asked to check these periods of the day against three columns marked "no change", "better", and "worse". In the same manner they were asked to check any change in mood. This aspect was included since change in mood could possibly affect stuttering, and the drug itself could conceivably bring about changes in mood. The term "mood" is a loose one, but it was felt that it has a colloquial meaning that would be responded to by the subjects.

The main difficulty experienced while drawing up this schedule was the method whereby the subjects' responses could be measured. Freely expressed answers would have been too subjective and the categorization of these would have been almost impossible since about 6,800 sheets were expected to be marked (for sixty five subjects - nineteen days later since the final schedule was drawn up). To limit possible responses, a system of rating was selected as the best method by which the answers could be measured. Each question was accompanied by five possible answers, extending from "much improvement" through to "much worse", the middle response always being the average or "no change" category. The subjects were requested to mark only one answer. A five-point scale from 1 - 5 was utilized in order to obtain numerical values which represented the rating or answer. The lower values represented improvement, the mid-value of 3 represented the average, and the values of 4 and 5 represented a worsening of the stuttering symptom. The scale values of the answers accompanying the questions are provided in the schedule reproduced in Appendix C. These scale values did not appear on the sheets given to the subjects. This form of rating by a scale of numerical values has been discussed by Thurstone and Chave (121) and Ferguson (37).

In order to detect and to prevent "automatic" marking, a "trick" question was included where the possible answers were a reverse of the usual order. This was question "99" where "many more situations" indicated improvement, whereas

this type of answer, accompanying the other questions, indicated lack of improvement. The order of the answers was randomized to prevent automatic marking, although it was expected that with time, subjects would become familiar with the pattern of the schedule.

It was considered necessary that the subjects keep some frame of reference in mind in terms of any change in their stuttering noted during the fifteen weeks of the study. The words "average" or "as usual" in the schedule were intended to refer to what their speech was like, or how they felt about their speech, for the period prior to the commencement of the study (January - March, 1963). Although this frame of reference was explained to the stutterers before the study started, it was not expected that it would be applied consistently. There would probably be some tendency for a subject to compare his speech, say in the tenth week of the study, with what happened a few weeks previously, rather than ten weeks previously.

The first part of the schedule, referring to the question "Did you take your drug today?" and the space set aside for the times when the subjects took the morning and evening capsule, was devised mainly as a reminder to the subjects to take their drugs regularly. At the same time it served to indicate to the experimenter the regularity with which the subjects were taking the capsules. It was intended to eliminate those sheets at the end of the experiment, where the medication (drug or placebo) was not taken for the particular days indicated. This section was only completed, as with questions 2 and 4, during the medication periods.

The subjects were requested to complete the daily schedules before retiring each night, and were asked to indicate whether the day had been usual or not. Where the day was considered to be unusual, the subject was asked to give an explanation. This enabled the experimenter to consider what the subject thought "unusual" so that a decision could be made to eliminate the sheet. For instance, minor accidents, the announcement of an engagement, an influenza attack,

/were ...

were considered by the experimenter as unusual occurrences.

A method of coding the final completed schedules was suggested by the statistician consulted, so that the results could be punched onto cards to be fed into the computer. Any answers that were spoiled or omitted were coded accordingly, and any answer sheets that were entirely spoiled were discarded. A few schedules for some of the subjects, during the first few days of the experiment, were discarded due to incorrect marking and confusion. In the majority of cases this occurred with the African subjects, despite the fact that every aspect of the schedule was explained and reiterated to all subjects before the commencement of the study. The confusions that arose in the beginning appeared to be concerned with the understanding of some of the questions.

Due to the very high costs incurred with a computer, the statistician recommended that the mood and stuttering chart depicting the various times of the day (page 2 of the schedule) be eliminated from the analysis. This recommendation was accepted by the experimenter since any information from these charts was not considered relevant to stuttering change itself. He recommended further that the two questions (2 and 4) pertaining to drug effects, and the last question (below the chart and not numbered) referring to a general rating of stuttering, should also be eliminated from the analysis. The reason for this is that these three questions have a different meaning and presentation from the remaining items on the schedule, and this difference would necessitate a separate analysis and correlation procedure. This would have added a great deal to the large expenditure already incurred with the main analysis and the results of the three-weekly assessments. Again, the elimination of these items from the schedule did not appear to be a great set-back, since the remaining twelve questions were concerned with the important aspects of the stuttering act, and could

/still ...

still provide sufficient information as to whether or not any changes had occurred over the experimental period.

The value of the schedule is by no means certain. Two queries come to mind. Firstly, are the questions framed in such a manner that the answers produced are indicative of the state of stuttering for a particular day; and secondly, is the method of rating, and thereby the derived scores, a reflection of the answers marked? It is thought that a comparison of the verbatim reports with the mean scores of the daily schedules might provide an answer to these queries. Both the schedule and the verbatim reports constitute, in the main, subjective material. An attempt, however, has been made to quantify the results and to categorize them in as objective a manner as possible.

SECTION VI - GENERAL PROCEDURE

1. During the month preceeding the experiment, the European subjects completed the Minnesota Multiphasic Personality Inventory. At this stage, convenient times for future appointments for the three-weekly assessments were discussed. Times were also arranged for the subjects to see the doctor administering the medication. An appointment was also made with the experimenter for a time prior to the commencement of the experiment. The same procedure was followed with the African subjects, except that they were not given the MMPI.

2. At the interviews before the study started, the future appointments were confirmed and a note was given stating the dates and times of all appointments, the dates when they were to start marking the daily schedules, etc. Each subject was given a batch of blank daily schedules. This schedule was then explained in detail and the general scheme of the experiment was reiterated. They were instructed to start marking the schedules on the 7th March. A smaller group was instructed to start on the 10th March. The reason for this arrangement was discussed previously (supra, Section IV B). As a reminder telegrams were sent to all subjects a day before they were due to start marking

/the ...

the schedules.

3. The procedure concerning the preparation of the drug, the allocation of drug and placebo to the two groups (Africans and Europeans treated separately), the administration of the drug by the doctor, etc., has been discussed in detail in a previous section (*supra*, Section II D and E).

4. During the first three-weekly interviews the completed schedules brought in by the subjects were checked. Any incorrect answers or apparent confusion was discussed. During each of the ensuing interviews, further batches of blank schedules were given, and the completed ones were checked quickly while the subjects were present.

5. At the beginning of each interview, general conversation was initiated by the subject or experimenter, and this led to an enquiry about the subject's speech, his feelings about the experiment, effects of the drug on his speech, etc. These comments were written down and read back for confirmation. The experimenter rated the severity of the stuttering symptom based on the spontaneous speech. The stutterer was then asked to rate his speech for the same day just before coming to the interview. He was also asked to describe the day in terms of events, and it was established whether the day constituted a "usual" or "unusual" day for him.

The subject was then requested to read the "Rainbow" passage aloud and was told that his reading would be recorded. A National 4-Track tape recorder stood in full view and the microphone was placed in front of the subject. All recordings were made at standard speed (3 $\frac{1}{4}$ IPS). While the subject read, the experimenter marked the moments of stuttering on a copy of the reading passage. This was done behind the tape recorder so that the subject would not be distracted by the details of the markings. After the reading the subject was asked to rate his speech as produced during the reading. At this stage the experimenter rated the subject's reading on the 9-point equal-appearing intervals scale which represented severity. This rating was made independently of the subject's severity rating.

/b. ...

6. After the recording, the subject was left alone to complete one of the forms from the IPAT S-Parallel-Form Anxiety Battery, which took approximately twenty minutes. During this time, the experimenter counted the moments of stuttering just marked, and on a form devised to contain the data, noted the total of these stuttering moments, together with the first severity rating made by the experimenter and by the subject. The subject's rating of his speech for the day was also noted.

7. When the Anxiety Battery had been completed, the subject was asked to listen to the recording made of his reading and to rate the severity of the stuttering.

8. After the subject had left, the experimenter tape-recorded a code letter and number which appeared just before the recording of the reading passage. This code was derived from a set of randomized numbers which identified the subject, and letters which identified the period of the experiment. The code was essential, as samples of the recordings were to be played to judges after the study had been completed.

At this time the experimenter played the tape recordings again and the following three measurements were taken: frequency moments of stuttering (marked on a second copy of the reading passage); reading rate, by timing the recording with a stop-watch; and a second severity rating of stuttering. (No reference was made to the initial scores obtained). The Anxiety Battery was scored and this, together with the data obtained from the first playback of the recording, was entered onto the data-sheet. These sheets were then filed away until the completion of the study.

9. Approximately one week later, and before the commencement of the next period, all recordings from the period just completed were played back. This was done in alphabetical order rather than by order of appointments. A third severity rating of stuttering was made and entered on a separate form from the data sheets and filed separately.

10. Completed daily schedules were returned regularly when the subjects attended their assessment-interviews.

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The subjects were asked to write a summary during the last week of the experiment, commenting on their reactions to the study as a whole, the effects they thought the drug had had on their speech, the general state of their speech during the various periods, etc. These comments were included in the verbatim reports. Arrangements were made to collect, or to have the subjects post, the last lot of completed schedules with the written summaries.

11. A month after the completion of the experiment, five judges rated the severity of stuttering from the recordings. The purpose of this was to test the reliability of the experimenter's ratings and the degree of agreement with judges. The judges were qualified speech therapists on the staff of the Speech Clinic, University of the Witwatersrand.

Recordings representing any two of the five periods were selected according to a set of random numbers. These recordings were removed from the original tape reels, spliced together, and placed, according to the randomized order, onto large reels. The judges were asked to hear the entire passage. The code numbers inserted at the beginning of the recordings were retained and a ten-second delay occurred before each recording was heard. This allowed the judges time to note the code on their forms before listening to the recordings. Five different coloured forms were used, one for each judge, in order to prevent the judges having to write their names on each form. The form contained a space for the code numbers and letters, and the nine-point equal-appearing intervals scale of severity of stuttering. The judges were asked to encircle the number representing their severity rating. The instructions to the judges were typed and were as follows:

The tape samples you will hear have been made by persons who regard themselves as stutterers. In each sample the "Rainbow" passage by Fairbanks is read. In some instances a 200-word portion of the passage will be read, and in others a 310-word portion will be read.

You are requested to make a rating of the severity of stuttering for each sample.

This rating is to be made on a nine-point equal-appearing intervals scale on which a rating of 1 means "no stuttering", a rating of 2 means "very mild stuttering" and a rating of 9 means "very

/severe ...

severe stuttering". A rating of 5 indicates "average severity". The other values on the scale represent equal intervals between 1 and 9. Please give only one rating for each sample heard.

Each sample will be preceded by a code number - please insert this number on the form before listening to the sample and marking your rating.

A separate form must be used for each sample.

The tape recorder will be stopped for approximately fifteen seconds between samples to allow you time to make your rating.

The judges were requested to consider the same criteria of stuttering speech as did the experimenter (supra, Section IV B). This was presented to each judge on a typed sheet.

In some instances where the recordings appeared to be lengthy (e.g. 15 minutes), the judges indicated that they had made their assessments of the particular recording. In these cases only, the tape was played forward at increased speed to the last portion of the recording. The first three recordings were replayed to the judges after they had rated all the recordings. This was done in order to afford them the opportunity of some practice in marking ratings. Their ratings on the replay of these three recordings were included in the results.

Ninety-two recordings were thus rated, which took the judges three sessions of two hours each. The final figures prepared for statistical analysis included the three severity ratings made by the experimenter.

12. Six weeks after the completion of the study, the experimenter was given the sealed list of the allocation of the subjects to either the drug or placebo groups. The information on the summary sheets of data for each period was transferred to one main form for each subject. The drug and placebo allocation for either the second or fourth periods was inserted on the form. These forty-six forms (37 Europeans and 9 Africans) were then ready for statistical analysis.

/Section ...

SECTION VII - STATISTICAL PROCEDURES

The design of this study was originally discussed with Professor J.E. Kerrich, Department of Statistics, University of the Witwatersrand. At his suggestion, Mr. R. Hall, chief statistician of the National Institute for Personnel Research, a division of the Council for Scientific and Industrial Research, was consulted regarding the experimental design finally chosen and the statistical procedures used in the final analyses.

Use was made of the IBM 704, 8K Computer of the C.S.I.R., Pretoria. The statistical and experimental procedures adopted in this study are discussed in the works by Snedecor (119), Fisher (39), Moroney (92), and Nass (95).

In many cases statistical procedures were used whereby the numerically odd subjects falling into either of the two sub-groups (receiving drug or placebo) caused by randomization, were eliminated from the analyses - e.g. in the "t" test for significant differences between the drug and placebo ratings, the number of European males used in the analyses was 30 (where 31 took part); the number of African males used in some of the analyses was 4 (where 8 took part). The one African female was eliminated from most of the analyses.

The eleven factors constituting the measurements taken during the three-weekly assessments were treated in various ways. Means and standard deviations were obtained for all the results concerning these factors. Correlations were carried out for all the factors over the five periods of the study, to ascertain their relationship between each other and the degree of agreement of the five judges with the experimenter's severity ratings. Three-way analyses of variance were used to test the consistency of the experimenter's three severity ratings; the consistency of the subject's self-ratings of the severity of stuttering; and the existence of adaptation to the reading passage. Tests for significance were carried out in order to ascertain carry-over effects of the drug or placebo; the effects of the drug; and the comparison of the drug response with a
/classification ...

classification of improvement based on the verbatim reports.

The means and standard deviations were obtained from the results of the daily schedules. Graphs were constructed to estimate the effect of the drug after a "trend" over the non-medicated periods had been taken into account.

SUMMARY OF CHAPTER

- I The aim of the study was to investigate the effects of Amylozone on adult stutterers. It was assumed that reduction in anxiety brought about by the drug would in turn reduce the severity and frequency of stuttering.
- II The methods of selecting European and African subjects were discussed, and the reasons for some subjects defaulting before the study commenced and during the study itself, were outlined. The ages and mean ages of the subjects were tabulated.
- III The organization concerning the drug administration and presentation was described, including the use of the placebo as part of the "double-blind" approach, dosage of the drug and medical supervision.
- IV The experimental design which the present investigation followed, was outlined. The rejection of a previous design utilizing two drugs was discussed. The five periods of the study were described and the methods of group allocation to either drug or placebo were outlined.
- V The measurements and assessments as applied to stutterers in this study were outlined. These concerned a personality inventory; eleven factors that were tested during the three-weekly assessments; the verbatim reports from the subjects; and a daily schedule, the construction of which was discussed.
- VI The general organization adopted in this study was outlined. This concerned the order of presentation of the procedures and measurements, and the methods of scoring the results.
- VII The statistical procedures used to analyse the results were described. These pertained to the three-weekly measurements taken, the verbatim reports, the daily schedule and the personality inventory.

CHAPTER 4

RESULTS AND DISCUSSION

The primary aim of this study was to ascertain the effects of the combination of trifluoperazine and amylobarbitone (Amylozine) on the speech of adult stutterers. Although an attempt was made to obtain objective data, it must be pointed out that the variability of stuttering, together with the psychologically unaccountable subtle reactions of subjects towards a drug, limits consistently objective assessment. The results must therefore be viewed with some caution. As the study progressed and various analyses were conducted and evaluated, it became apparent that a secondary aspect of the study presented itself, namely that of the nature of the measurements of stuttering behaviour.

The African subjects taking part in this study were treated separately from Europeans in the majority of analyses of data. This data pertained particularly to the effects of the drug, verbatim reports and the results of the daily schedules. There are some instances where the scores for the African subjects were incorporated with the data for European subjects, which occurred when the following were taken into consideration:

Correlation of the experimenter's severity ratings with those made by judges.

Intercorrelation matrix where the relationship of the measures were compared.

Consistency of the experimenter's severity ratings.

Consistency of the subjects' severity ratings.

Adaptation to the reading passage.

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SECTION I - THREE-WEEKLY ASSESSMENTS AND MEASUREMENTS

The data presented in this section concern the eleven items described in Chapter 3, Section IV. The raw data obtained for these eleven factors (variables) for each subject for each period are given in Appendix D, Table I. The group means and standard deviations based on the raw data are given in Appendix D, Table II. The means and standard deviations for the subjects are presented according to the two main groups - Group A and Group B. Group A received the drug during the second period of the study, and Group B during the fourth period. These groups were further divided into the following:

- European males
- European females
- European males and females
- African males
- All males (European and African)
- Total subjects

The information given in Appendix D, Table II accounts for thirty-six Europeans and eight Africans, where thirty-seven Europeans and nine Africans took part in the experiment. The elimination of one European (male) and the only African female was made in order to maintain a numerical balance in the number of subjects falling into either Group A or Group B.

Various statistical analyses were applied to the data presented in Appendix D, Tables I and II. As a frame of reference the following legend is outlined where a number represents the specific factor measured, and for convenience, these representative numbers will be referred to in parentheses in the text.

/factors ...

<u>Factors measured (variables)</u>	<u>Reference Number</u>
Experimenter's Severity Rating of Stuttering:	
On subjects' reading	1
On 1st playback of recording	2
On 2nd playback of recording	3
On spontaneous conversation	4
Subjects' Severity Rating of their own Stuttering:	
On their reading	5
On 1st playback of recording	6
Frequency Count of the Stuttering Moments:	
On the reading	7
On 1st playback of recording	8
Reading Rate in words per minute	9
Subjects' Severity Ratings of Stuttering for the same day prior to the interview	10
IPAT Anxiety Battery scores	11

Before presenting the results regarding the effectiveness of the drug according to the three-weekly assessments (sub-section C), it would be pertinent to provide information related to the measurements themselves, and aspects concerning these. The following will be considered:

- A. Comparison of the Experimenter's Ratings of the Severity of Stuttering with those made by Five Judges.
- B. Comparison of the Eleven Factors.
- C. Consistency of the Experimenter's Severity Ratings.
- D. Consistency of the Subjects' Severity Ratings.
- E. Carry-over Effects of Drug or Placebo.
- F. Adaptation Effect to the Reading Passage.

A. COMPARISON OF THE EXPERIMENTER'S SEVERITY RATINGS OF STUTTERING WITH THOSE MADE BY FIVE JUDGES

Five judges rated any two recordings of the reading

/passage ...

passage made by each subject out of a possible five (representing the five periods of the experiment). These recordings were randomly selected and were played to judges over three sessions. The judges' ratings were compared with each other and with the experimenter's. The results were inter-correlated where the ratings of the five judges were used, together with the experimenter's three ratings (factors 1, 2 and 3). The three correlation matrices in Tables 3, 4 and 5, depict the judges and experimenter's ratings for the first and second recordings chosen, and the correlations between the ratings of the two recordings. The inter-correlations were derived from the raw scores, means, and standard deviations reproduced in Appendix E.

TABLE 3

Inter-correlations of the severity Ratings of Stuttering made by five Judges and the Experimenter for the first Group of Recordings heard

JUDGES					EXPERIMENTER		
1	2	3	4	5	E1	E2	E3
1.00							
.93	1.00						
.85	.91	1.00					
.86	.92	.92	1.00				
.92	.94	.91	.90	1.00			
.88	.88	.85	.88	.88	1.00		
.90	.92	.88	.89	.91	.96	1.00	
.89	.91	.88	.88	.90	.95	.97	1.00

Significance at 1% level = .36

/Table 4 ...

TABLE 4

Inter-correlations of the Severity Ratings of Stuttering
made by Five Judges and the Experimenter for the Second
Group of Recordings Heard

	JUDGES					EXPERIMENTER		
	1	2	3	4	5	E1	E2	E3
1.00								
.92	1.00							
.85	.91	1.00						
.92	.95	.92	1.00					
.93	.91	.90	.93	1.00				
.87	.92	.89	.93	.90	1.00			
.88	.92	.88	.93	.90	.95	1.00		
.96	.91	.86	.92	.93	.96	.96	1.00	

Significance at 1% level = .36

TABLE 5

Inter-correlations of the Severity Ratings of Stuttering
made by Five Judges and the Experimenter between the two
Groups of Recordings Heard

	SECOND RECORDING	FIRST RECORDINGS							
		JUDGES					EXPERIMENTER		
		1	2	3	4	5	E1	E2	E3
J	1	.92	.82	.78	.72	.81	.76	.80	.80
U	2	.84	.87	.80	.78	.80	.81	.85	.85
O	3	.79	.86	.85	.76	.85	.80	.83	.84
G	4	.81	.85	.80	.77	.83	.82	.84	.84
E	5	.76	.81	.79	.71	.92	.77	.81	.82
S	E1	.74	.79	.74	.67	.75	.75	.79	.80
E	E2	.72	.75	.72	.67	.79	.76	.80	.80
X	E3	.72	.74	.65	.62	.73	.72	.76	.77
P.									

Significance at 1% level = .36

/The ...

DISCUSSION

The matrices (Tables 3, 4 and 5) show high correlations for the experimenter's three severity ratings (reading, 1st and 2nd playback). The correlations range from .95 to .97 for both recordings (Tables 3 and 4). The correlations between the experimenter's ratings and those of the judges ranged from .85 to .92 for the first recordings heard (Table 3) and from .86 to .93 for the second recordings heard (Table 4). These are higher than the correlations between the two recordings for the individual judges (inter-judge), where correlations ranged from .71 to .87 (Table 5), or for the between-recordings for the experimenter, where correlations ranged between .75 to .80 (Table 5). This last correlation is possibly affected by actual differences in the subjects' stuttering from one period to another - an effect by which the judges could not have been influenced. The correlations between the judges themselves (intra-judge) range from .85 to .94 for the first recordings heard (Table 3) and from .85 to .95 for the second recordings heard (Table 4). These are all high and show a satisfactory measure of agreement. These findings support the evidence contributed by Cullinan et al. (31) where intra-judge reliability coefficients tended to be greater than the inter-judge reliability coefficients, i.e. the judges tend to agree better with themselves than with other judges.

From the matrices (Tables 3 and 4) it can be seen that the experimenter obtained very high correlations between her three ratings for each recording - the correlations for the first recording range from .95 to .97, and for the second recording from .95 to .96. This would indicate that there is little difference between the ratings of the severity of stuttering during the reading while the subject was present and a rating made ten days later from a recording. It appears then that, in this study, the visual cues displayed by the subjects while reading had very little effect on the severity ratings made. It can be postulated that tensions displayed during the actual reading (where stuttering is physically manifest and can be "seen") are reflected in the manner of reading itself (i.e. the speech) so that they are auditorily detected in the recordings heard.

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