THE EFFECTS OF ANXIETY ON VERBAL PRODUCTIVITY AND VOCABULARY DIVERSITY

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This study was concerned with the extent to which certain psycholinguistic features in free speech samples would reflect differences in predispositional anxiety as measured by the Taylor Manifest Anxiety Scale as well as differences in situational anxiety manipulated by using two different interview conditions. The psycholinguistic features which served as dependent variables were a measure of verbal productivity (total number of words) and measures of vocabulary diversity (number of types; the type-token ratio; the log type-token ratio; the mean segmental type-token ratio; skewness; kurtosis; Yule's K; Herdan's v_m and v_m2; and the mean of mean type length).

Hypotheses were generated from Spence's (1958) theory of emotionally based drive and consequently the effect of anxiety was expected to be facilitory rather than debilitating. To control for the interference of personality factors related to intelligence, subjects (Ss) were given a test of their ability to handle abstractions and a test of their vocabulary knowledge. The Ss were also asked to define their reaction to the particular interview they were given to ensure that the differential impact of the two interviews was in the expected direction. Finally an intercorrelational study was performed across all Ss between the measures of vocabulary diversity to see the extent to which these measures could be considered similar.

Findings from the 2 X 2 analyses of variance were not significant for the measure of verbal productivity. Results were ambiguous for the measures of vocabulary diversity. The type-token ratio and the log type-token ratio were significantly sensitive ($p<.05$) to differences between High Anxious (HA) and Low Anxious (LA) Ss but not to differences

between the interviews. The significant difference was the result of greater diversity in the vocabularies of the LA Ss. Skewness, kurtosis, v_m and v_m2, Yule's K and the mean of mean type length showed a statistically significant difference ($p<.05$) between interviews but not between Ss. The statistically significant difference was due to the greater vocabulary diversity in the speech samples of those Ss given the least anxiety arousing interview.

The correlational studies between selected verbal indices and the additional personality variables did not produce clearcut results. For HA Ss there was a positive correlation between vocabulary knowledge and the mean segmental type-token ratio ($p<.01$) and a positive relationship between Ss' ability to handle abstractions and total number of words and mean of mean type length ($p<.05$). For LA Ss there were no statistically significant relationships.

The intercorrelational study between measures of vocabulary diversity erased the naive assumption that these measures were unequivocally the same. The lack of equivalence in these measures is partly explained in terms of their structural differences and offers some basis for explaining the unexpected results of the analyses of variance.

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INTRODUCTION

A man's speech has long been thought to reveal his essential personality as well as to betray his feelings. Although there has been much speculation since the turn of the century concerning the relationship of an individual's speech to his personality, little is known as a result of systematic experimentation. The present study was designed to examine the effects of anxiety both as a viable dimension of personality and as an immediate response to a given situation on some basic components of spontaneous speech. The primary concern was exploration of the extent to which one can depend upon the selected speech characteristics of verbal productivity and vocabulary diversity to reflect various facets of the speaker's personality, as well as the dimensions of his immediate reactions.

Sanford (1942), Miller (1951) and Mahl and Schulze (1964) all have attested to the relationship between speech and the personal

dynamics of the speaker. Sanford, in his summary of relevant early research, pointed to the promise of the "objective-descriptive" approach to the study of this relationship. He asserted that a study of an individual's verbal behaviour, being careful in its analyses and relying on the quantification of variables, would surely reward the investigator by disclosing features of the subject's personality. While Sanford gave the impression that perusal of a speech sample would render information to the psychologist in much the same manner that the hand divulges personal secrets to the palmist, he was nevertheless among the first to direct attention away from semantics to structural elements in communications. Thus he encouraged investigators to look at how the individual said something as well as considering what he said.

Mahl and Schulze (1964), in a comprehensive coverage of studies dealing with nonsemantic aspects of language and concurrent anxiety, characterized the numerous measurements they mentioned as "extralinguistic." The results they quoted suggested that these extralinguistic features may have been more sensitive to fluctuations in a person's emotional states as well as clearer mirrors of his personality structure than what he actually says. Because the majority of studies in this area dealt only with situational or transient anxiety, Mahl and Schulze attempted to arouse experimenters to the need for more systematic description of the relationship between personality variables and speech indices. Most of the studies that have been even remotely concerned with personality have used clinical diagnostic categories as the basis for separating their Ss

into groups (Fairbanks, 1944; Mann, 1944). Mahl and Schulze (1964) criticized this approach to S selection and classification as at best a very crude method for studying individual differences. They contended that experimenters must begin to separate their Ss according to experimentally meaningful personality traits. Such experimental needs had provided impetus for researchers in other areas of psychological inquiry - such as Taylor (1953) - to devise methods of classifying Ss of which the Taylor Manifest Anxiety Scale (MAS) is but one example. However, this and similar devices have only been used in psycholinguistic research within the last decade and remain to be applied to the rich variety of measures offered in linguistically oriented studies.

BASIC RESEARCH IN THE EFFECTS OF ANXIETY ON SPEECH

Research into the effects of anxiety on speech initially involved experimentation with a great variety of dependent variables. A number of verbal measures were created out of the clinical psychologist's interest in objectively assessing the changes in a patient's anxiety during therapy sessions. Busemann (1925) in his analyses of the German * language introduced the verb/adjective ratio which he considered was inversely related to emotional stability. Balken and Masserman (1940) defined the ratio as sensitive to anxiety states in psychiatric patients; it appeared to these investigators that as anxiety increased, the qualifying and descriptive parts of speech decreased. Lorenz and Cobb (1954) found that all of the psychiatric patient groups they studied had higher verb/adjective ratios than their normal controls. Back, et al. (1955)

* It should be kept in mind that unless specified otherwise the studies mentioned in this paper used English language samples.

found a negative correlation (-.37) between verb/adjective ratios and a measure of vocabulary diversity for psychiatric in-patients. It appeared that the greater the emotional stability of the individual, the more diverse was his vocabulary and consequently the nature of his communication was thought to be more informative.

Dollard and Mowrer (1947) devised the Discomfort-Relief Quotient (DRQ) as a method for measuring tension in social case records. This was based on semantic content, being defined as the total number of discomfort words divided by the total number of discomfort plus relief words. The quotient was supposed to increase when things were going badly for the client, that is, when his anxiety was high and drive was increased. These investigators also found that the quotient reflected clinically-judged discomfort (anxiety) during interviews. Auld and Mahl (1956) examined this measure in recorded interviews with neurotic patients, attempting to relate it to individual differences in anxiety, hostility and dependence. They obtained nonsignificant correlations among these clinical ratings and DRQ scores, and they discouraged use of this measure in exploring individual differences in tension. Nevertheless, while the investigators felt that the measure was ineffective for detecting differences among individuals, they felt it was still of some value in measuring changes in tension in one individual during an interview.

Mahl (1956) pioneered interest in the more nonverbal aspects of speech when he introduced his two "linguistic measures of patient's anxiety in therapeutic interviews." His measures were based on the assumption that the most valid measures of anxiety would be found in

the prosodic aspects of speech rather than in its manifest content. His measures were the Speech Disturbance Ratio (SDR) and the Patient-Silence Quotient (PSQ). Both of these increased with clinically judged increases in a patient's level of anxiety during therapy. Later Mahl divided the SDR into the Ah-Ratio and the Non-ah Ratio, the latter being more sensitive to an individual's changes in affect.

Dibner (1956) devised his Cue Scales for measuring anxiety in interviews with psychiatric patients. Cue Scale I covers a variety of speech disturbances (unfinished sentences, blocking, interrupted sentences, repetitions, etc.) while Cue Scale II is related to voice characteristics (laughing, sighing, voice changes). Dibner clearly stated that these scales were intended as measures of transient anxiety and not of individual differences. He found that his Cue Scales correlated more highly with clinicians' global ratings of anxiety and patients' self ratings than with the Galvanic Skin Response (GSR).

Eldred and Price's (1958) investigation operated within the system of vocal but nonverbal components of speech such as pitch, rate, stress and pauses. They found that increased interruptions in the smooth flow of speech (pauses) communicated the presence of anxiety. Ruesch and Prestwood (1949) had previously suggested that deviation in pitch and loudness, verbal output, speech rate and duration of pauses were all affected by anxiety. Goldman-Eisler (1958) had hypothesized that hesitations were related to the speaker's uncertainty which may be as much a function of cognitive activity as

of emotionality. Krause and Pilisuk (1961) built seven speech disturbance categories from Mahl's (1956) and Dibner's (1956) respective classifications, then looked at them singly and together as indicators of transient anxiety. They found that the pooled classifications produced the most significant indications of anxiety. The most sensitive single category was that including nonverbal intrusive sounds such as laughs and sighs.

Within these surges of research there emerged some significant trends. First there was an initial preoccupation with verbal content which, yielding only meagre results, bowed to the focus on structural aspects of language. Secondly researchers chose to examine situational variables rather than explore predispositional elements beyond the confusion of psychiatric classifications of Ss. They concluded that their methods of measurement were more effective in detecting intra-individual changes than differences among speakers. In spite of the limitations of some of these esoteric early measures, current research has attempted to maintain some communication with similar research in the past. Thus, in order to translate the findings from many recent studies one must appreciate their dependence upon their more cumbersome predecessors. It is nevertheless the case that research involving speech and anxiety continues to be involved in the discovery of new and more viable dependent variables, a factor which provides justification for a brief digression into the development of linguistic measures of vocabulary diversity, for some of these measures, while having proven themselves of value in linguistic research, remain to be included in research of a psychological nature.

DEVELOPMENT OF MEASURES OF LANGUAGE DIVERSITY; AN EXTRA-PSYCHOLOGICAL DIGRESSION

The type-token ratio (TTR), a rudimentary measure of vocabulary diversity, was introduced by Johnson (1939) and is the number of different words* in a speech sample (types) divided by the total number of words in the sample (tokens). However, taken in its unaltered form this measure of diversity is extremely sensitive to sample size. The problem is simply this: as the sample increases in size, the number of new words introduced decreases, and consequently the TTR decreases. It is therefore only meaningful to compare TTRs of language samples of equal size.

The mean segmental type-token ratio (MSTTR) was offered by Schafitz (1941) as one way to make TTRs for language samples of different size comparable. This measure is found by dividing the sample into equal sized segments, calculating the TTRs for each segment and then finding the mean TTR for the entire sample by dividing the sum of the segmental TTRs by the number of segments. However, MSTTRs from different language samples must be based on segments of equal length before they can be compared meaningfully.

The bilogarithmic TTR (log TTR) was developed by Chotlos (1944) in order to control for sample size in yet another way. It is found by dividing the logarithm of the number of types by the logarithm of the number of tokens. While the log TTR does not manage the problem of sample size completely, its imperfection only comes to the fore when one wishes

*The word is here defined in the graphic sense as a group of letters bounded by spaces, i.e., Space / Letters / Space

to compare either very large (>10,000 words) or very small (<100 words) language samples or samples which differ excessively in size with each other (Carroll, 1967).

Yule (1944) devised his characteristic K in order to obtain a measure of vocabulary diversity - not only free from the harrassment of sample size, but also sensitive to the overall distribution of type-token relationships. It is represented by the following formula:

$$K = 10{,}000\ (S_2 - S_1) / S_1^2$$

where

10,000 = a constant to avoid uncomfortably long decimals

$S_1 = \sum \left[f_x \cdot x_i \right]$ where f_x = the frequency of occurrence of words in a language sample and x_i = the number of types of that given frequency of occurrence; S_1 then equals the number of tokens in a sample.

$S_2 = \sum \left[f_x^2 \cdot x_i \right]$

The individual with redundant speech will show a larger difference between values for S_1 and S_2 and consequently a higher K. Thus an increase in K indicates redundancy and a decrease in K speaks for diversity in a language sample.

Herdan (1956) created a measure very much like Yule's K except that it does not use the comfort constant (10,000). Working with the word frequency distribution of a language sample, Herdan states his formula for v_m in common statistical parameters: M, the mean; σ, the standard deviation: and N, the sample size (or number of word types): $v_m = \sigma / M\sqrt{N}$. v_m is comparable to $\sqrt{K}$ while K is comparable to $v_m 2$.

Schafitz (1941) compared mean word length (number of letters in a word) with the MSTTR and found a positive correlation (.50). Thus it may be identified as yet another measure of variety in vocabulary. Zipf (1935) had demonstrated that rare words tend to be longer than common words and thus mean word length was thought to reflect the relative rareness of words used. Shafitz, in her study comparing written language samples of children to I.Q. and chronological age, did not find any relationship between these variables and her measure. Preston and Gardner (1967) found that mean type length was a significant measure of language diversity in both written and oral language samples. They also noticed that in written language samples this measure, along with a slight positive loading from Manifest Anxiety (using Bendig's 1956 short form), contributed to a factor they identified as Written Language Diversity. The basic assumption was that the larger the mean type length, the more diverse is the language sample.

Wachal (1967) found that measures of skewness and kurtosis were among the most valuable in his attempt to resolve the authorship problem related to the Federalist papers. When applied to the word frequency distribution of individual Ss, these measures served to describe the variability of speakers' word choices. For example, word distributions that are highly positively skewed indicate that the verbalizer uses more of the same words more of the time and thus his vocabulary is relatively redundant. A positive value for kurtosis indicates that the word distribution is more highly peaked and again suggests that the speaker's word choice is restricted.

The foregoing measures of vocabulary diversity offer the researcher a variety of approaches in determining the degree to which language samples are either expansive or restricted in word choice.

THE RELATIONSHIP OF ANXIETY TO VOCABULARY DIVERSITY

Pertinent research concerning the effects of anxiety on vocabulary diversity have centered around use of the TTR. Fairbanks (1944), using spoken language samples, found that the TTRs of schizophrenics were lower than those of normal individuals. If Mednick's (1958) view of schizophrenia is accepted, this finding may be interpreted as showing that individuals operating under higher drive have more redundant speech samples. Back et al. (1955) found a negative relationship in speech samples of one psychotherapy patient between TTRs and the general SDR; another patient, however, did not produce any correlation at all between these measures. Gottschalk (1961) reported an inverse relationship between TTRs and Non-ah SDRs in speech samples from one patient in psychotherapy, as well as an inverse relationship between TTRs and content analysis scores of free anxiety. Feldstein and Jaffe (1962), found that there was a negative relationship between MSTTRs and Non-ah SDRs and a positive relationship between TTR variances and Non-ah SDRs for normal Ss. No significant relationship emerged in their comparison of these measures for schizophrenics. Moses (1959) found higher TTRs in the spoken responses of college students with instructions to talk about their most pleasant experiences than with instructions to talk about their most unpleasant experience. Gardner and Sugerman (1964) reported a negative relationship between TTRs in speech and scores on

the MAS, but not between the MAS and TTRs in written language. DiMascio (1961), however, did not find any significant relationship between TTRs and two physiological measures which were hypothesized to be related to anxiety and emotional arousal defined in terms of heart rate and skin temperature.

In summary, while the results of some of these studies suggest that there is an inverse relationship between the TTR and anxiety, a majority of them emphasize the fact that this relationship is not clear and that further research is needed to confirm Jaffee's (1961) statement:

> Previous experience with TTR analysis indicates that low TTR (repetitious verbal transactions) is characteristic of affect, misunderstanding, confusion and anxiety, in short, the various agitations which interrupt the smooth flow of referential verbal communication. (p. 83)

As Mahl and Schulze (1964) stated, even when a relationship emerged between the TTR and some index of anxiety, that relationship tended to be inverse and did not hold true for all kinds of verbal samples, all types of Ss, or all the various measures with which the TTR was compared. Considering the TTR as representative of measures of vocabulary diversity, these experimental results do not clearly indicate that anxiety is either positively or negatively related to vocabulary diversity.

THE RELATIONSHIP OF ANXIETY TO VERBAL PRODUCTIVITY

Verbal productivity is measured as mere number of words, and by reason of its simplicity and directness, has been used in studies analysing the effects of anxiety on speech. The exact nature of the relationship between verbal productivity and anxiety is confused

in part by the fact that some studies indicate an inverse relationship while others suggest that the relationship is direct.

Lerea (1956), representative of those investigators who found an inverse relationship, used the recorded speeches of freshmen college students in a speech class and found that "minimal speech fright" was associated with greater verbal output. Levin et al. (1960), counting words in the impromptu stories of children ages 10 to 14, found that the children responded with longer stories when they told them to a familiar examiner than when they told them to a stranger. It was assumed that the comfort the children felt with the familiar examiner facilitated their verbal output, while the discomfort they felt with the stranger inhibited them. Similar findings were reported by Feldstein (1962) who observed that both schizophrenics and normals were more verbose when communicating nonaffective content than when communicating affective material ($p<.01$). The assumption was that the affective content was accompanied by increased anxiety. Neither Schulze (1959) nor Blumenthal (1961) found that inducing anxiety and increasing stress of their schizophrenics and normal control Ss resulted in increased verbal productivity.

Some studies suggest a direct relationship between anxiety and verbal productivity. Krause (1961a; 1961b) reported a significant positive relationship between verbal productivity of patients in psychotherapy and their Non-ah SDRs and Cue Scale I. Increases in both of these latter measures, as discussed earlier, are thought to show anxiety in the speaker. This same experimenter also found that verbal productivity was negatively related to verb/adjective ratios.

If it is accepted that a decrease in the verb/adjective ratio is consonant with increases in anxiety, then this finding also supports a positive relationship between anxiety and number of words. However, these correlations were based on medians of intra-subject correlations and there was enormous variability between Ss. Siegman and Pope (1962) used number of clause units as their basic measure of productivity in a study of the initial interviews of eight psychotherapy patients. They found significant positive correlations between this productivity measure and Non-ah SDRs. In another study using normal Ss (nursing students) in an interview situation, Siegman and Pope (1965) found a positive correlation (.31) between number of words in a response and MAS scores. Thus productivity measured in number of words, while producing conflicting results between studies, nevertheless has profound relevance in studies of anxiety and verbal behaviour.

THEORETICAL CONSIDERATIONS; CHOOSING A THEORETICAL DEFINITION OF ANXIETY

The immediate investigation was designed to measure differences in some basic speech characteristics as a function of differences in predispositional and experimentally manipulated anxiety. This distinction between situational and predispositional anxiety was not intended to suggest that these two types of anxiety either spring from different sources or are qualitatively different in their expression. Predispositional anxiety simply describes the basic reactivity of the individual, while situational anxiety refers to that sensit'zation to stimuli created within the experimental setting. Both then may be viewed as the anxiety that emerged in Spence's theory of emotionally based drive (1958). This theory is based on the assumption that E (the excitatory potential),

the factor that determines the strength of a response, is a multiplicative function of H (a learning factor) and D (a generalized drive factor). Spence explained D in terms of a mechanism which augments responses in the organism and which is an emotional response (r_e) elicited by the arousal of a relevant need or by aversive stimulation.

This theoretical position also assumed that individuals differ with respect to their responsivity to stimulation, and Taylor's Manifest Anxiety Scale (MAS) (Taylor, 1953) was devised to assess this difference. The MAS therefore serves as an operational definition of the (r_e) variable. In several studies using eyeblink conditioning, Spence (1958) found that High Anxious (HA) Ss conditioned faster than Low Anxious (LA) Ss. He explained this result by speculating that HA Ss operate under higher drive than LA Ss and are more reactive than the LA.

When dealing with verbal behaviour, certain questions are raised by adopting this theoretical orientation. First of all, Spence gleaned the greatest experimental support for this theory from simple tasks. It must be decided whether or not verbal behaviour in an interview situation actually fits into that paradigm. At least two experiments dealing with simplified verbal behaviour have contributed positive results. Reiter (1966) found that HA Ss were more readily conditioned to a selected critical word than LA Ss. In the general area of verbal productivity, Davids and Eriksen (1955) found that high scores on the MAS correlated with a high number of associations given in response to stimulus words on a chained word

association task. However, both of these experiments used what may be considered artificial language conditions. Osgood (1960) had suggested, when he stated that the events in the speaker form the events of his speech, that it is in the natural language situation that the interdependence of these two fields of events is preserved with the greatest integrity.

The second question generated by using Spence's theoretical approach was whether heightened drive would be facilitory or debilitating when coupled with verbal behaviour. Since the verbal behaviour in the interview used in the research presented here was identified as comparable to behaviour in simple tasks, this question is answered in part by Spence's prediction that heightened drive would contribute positively to the behaviour in question.

Osgood (1960) suggested an alternative theoretical emphasis. In discussing the effects of motivation or increased drive on speech, he mentioned that language habits, like habits in general, are organized into hierarchies of alternatives. With increased drive the habits that enjoy more stability in the hierarchy become more active, consequently, in his view, increased drive leads to stereotypy of response and reaches its summit in absolute disorganization. If Osgood's position is accepted, then the effects of increased drive would be debilitating rather than facilitory.

Osgood and Walker (1959) tested this hypothesis in an analysis of the difference between suicide notes and notes written by normals with respect to certain psycholinguistic features. He

found more stereotypy in the communications of the suicides. The fact that Osgood used written language samples, and that he did not give any definition of heightened drive beyond the intent to commit suicide (and carry through with it), limits the applicability of his results. His theory, however, appears to be a viable alternative to Spence's.

PROTOTYPICAL STUDIES; RECENT RESEARCH WHICH DIRECTLY INFLUENCED THE STRUCTURE AND ORIENTATION OF THE STUDY

In their 1965b study, Siegman and Pope dealt with personality variables and their impact on verbal productivity and verbal fluency in an initial interview. That study, using Bendig's (1956) short form of the MAS, found that predispositional anxiety correlated positively with verbal productivity. The other experiment by these investigators (1966) examined the effects of interviewer ambiguity-specificity and the anxiety arousing potential of interview topics on the vocabulary diversity of the interviewee. Using the mean segmental TTR based on 25 word segments, they found that interviewees produced higher mean segmental TTRs in response to the more ambiguous interviewer remarks, and in response to the more anxiety arousing topics. Pope and Siegman (1965a) had previously found that interviewer specificity and topical focus had the same effect on verbal productivity. That is, the low specificity questions and the anxiety arousing topics elicited greater productivity than the high specificity questions and the neutral topics. It is pertinent to note that in their experiments, Siegman and Pope (1965a; 1966) had used two separate topics for each of the interviews: in the neutral

(minimally anxiety arousing) interview the topic was school history while in the anxiety arousing interview the topic was family relations. The use of two different subject areas in the interview conditions raises the serious question whether the results from this study can be accepted as differences due only to the anxiety arousing potential of the two conditions. It would seem there was obvious contamination introduced by using two different subject areas.

While Siegman and Pope (1966) may have controlled poorly for subject area, they did recognize the fact that anxiety was not the only factor that could influence verbal behaviour. They felt that intelligence must also be given consideration. Chotlos (1944) had found significant positive correlations between intelligence scores and vocabulary diversity using the written language samples of children. Both Chotlos (1944) and Feenstra (1965) found that TTRs were positively related to the school grade of the children, suggesting the important influence that knowledge of the language has on vocabulary diversity. Feenstra (1965), however, using smaller language samples than Chotlos, did not find TTRs to be positively related to I.Q.

Preston and Gardner (1967) presented a factor analytical study attempting to define the major personality and ability factors associated with verbal fluency and diversity. They found that diversity (TTRs) of spoken language was related to associational fluency (Guilford's Associations-IV Test), while diversity in written language was related to vocabulary knowledge (The Advanced Vocabulary Test).

Gardner and Sugerman (1964) found that diversity in written language was positively related to Word Fluency (Thurstone and

and Thurstone, 1941), but diversity (TTR) in spoken language was not. Thus there is some indication that the TTR is related to different factors in written language than it is in spoken language. Gardner and Sugerman supported the idea that in written language the TTR reflects language knowledge, while in spoken language it is primarily sensitive to affective factors.

Siegman and Pope (1966) used the Shipley Hartford Institute of Living Scale as their measure of intelligence. This test includes an abstractions subtest designed to measure the individual's ability to handle abstract concepts, and a vocabulary subtest designed to measure his verbal knowledge. Siegman and Pope (1966) found that there was a positive but insignificant correlation (.141) between TTRs and the vocabulary range test, and that there was a positive and significant correlation (.447) between TTRs and the abstraction subtest scores. The language samples these investigators used were oral and the Shipley Hartford Institute of Living subtests were both written. The results from this analysis, however, seem to indicate that ability to handle abstract concepts is more important in the production of more diverse vocabularies in speech than is knowledge of the language. The strong positive correlation between the abstractions subtest scores and TTRs suggested that apparent ease in handling abstract concepts may be related to ease in handling the verbal demands of the interview situation. At any rate these investigators have managed to impress their experimental successors with the need to give consideration to the important

variable of intelligence when dealing with language behaviour.

THE STRUCTURE OF THE STUDY

Partly in answer to Mahl and Schulze's (1964) statement of experimental need, the immediate study attempted to focus on anxiety as both a personality and a situational variable, and then chose to examine the effects of these variables on the speaker's verbal productivity and vocabulary diversity Following the example of Siegman and Pope (1965, 1966) relatively spontaneous language productions of the interview situation were used for obtaining verbal samples. It was felt that such speech samples would betray predispositional and situational anxiety with the greatest intensity, as well as provide the experimenter with results that might be potentially applicable to the interview situation in the clinical setting

Predispositional anxiety was defined in terms of the MAS and Ss were separated into two groups, HA and LA, in keeping with their scores on the questionnaire. Situational anxiety was manipulated by exposing Ss to one of two interviews which differed in their anxiety arousing potential. The most anxiety arousing interview was identified as the Personal Interview, and involved asking Ss to give their personal opinions and to draw from their own personal experiences in answering the interview questions. The least anxiety arousing interview was identified as the Impersonal Interview in which Ss were asked to give impersonal or general answers to the questions. An innovation in the present study was to keep the topics in the two interview conditions the same and simply to vary the

anxiety arousing potential of the two interviews by making the questions in one personal and those in the other impersonal. The finding from Siegman and Pope's (1965a; 1965b; 1966) research offered some rationale in selecting a personally referential interview as the more anxiety arousing condition in the immediate research. The present study also used the general topic of the S's experience in university in both interviews and varied the personal impact of the interviews by using the second person singular pronoun in directing the questions to the Ss in the Personal Interview and the third person singular and plural pronouns in the questions in the Impersonal Interview.

The dependent variables used were the basic measure of verbal productivity (number of words) and measures of vocabulary diversity including the type-token ratio, the log type-token ratio; the mean segmental type-token ratio, Yule's K, Herdan's v_m and $v_m 2$, number of types alone and the mean of mean type length.

As in the Siegman and Pope's (1966) study, intelligence was a secondary concern of the immediate investigation. It was felt that individuals may not only produce different productivity and diversity scores because they are differentially affected by anxiety, but also because they differ in the number of words they know. Intelligence, especially defined as verbal intelligence, may well be a major determinant not only of basic fluency but also of the diversity of the vocabulary in the individual's communication. Both the abstractions and vocabulary subtests were given to each S in order to obtain a measure of her verbal intelligence, and of her ability to handle abstract concepts and in this manner control for intelligence.

Finally the Ss were asked to rate their feelings during the interview on a three point scale. This was used to determine whether or not the differential impact of the two interview conditions was in the expected direction.

HYPOTHESES AND PREDICTED OUTCOMES

Although Osgood's theory (1959) was entertained when considering a theoretical point of view for this study, Spence's theory of anxiety seemed most applicable to the behaviour in question. Consequently Spence's more optimistic expectations governed the experimental predictions in this study in spite of a paucity of results from studies using language samples and subject classifications similar to those used here.

The specific hypotheses are:

I. On the basis of Spence's theory of emotionally based drive, it was expected that Ss identified as HA on the MAS would be more verbally productive (i.e., produce more words within both interview situations) than would LA Ss.

II. Within both S groups it was expected that Ss given the Personal Interview would be more verbally productive than those given the Impersonal Interview. Thus the hierarchy of cell means was expected to be HA Ss given the Personal Interview with the highest mean, HA Ss given the Impersonal Interview next highest, LA Ss given the Personal Interview third highest and LA Ss given the Impersonal Interview, lowest.

III. Assuming that the interviews are equivalent to Spence's simple task situations, it was expected that HA Ss in both interview

situations would produce vocabularies of greater diversity than LA Ss.

IV Within S groups it was expected that Ss given the Personal Interview would produce more diverse vocabularies than those given the Impersonal Interview. Thus the hierarchy of cell means was expected to be HA Ss given the Personal Interview, the most diverse vocabularies; LA Ss given the Impersonal Interview, second most diverse; LA Ss given the Personal Interview, third most diverse; and LA Ss given the Impersonal Interview, least diverse.

Hypotheses I and III were based on the assumption that the effects of predispositional anxiety on verbal behaviour is relatively free from contamination from other personality variables. However, to control for possible interference from other personality variables related to verbal behaviour, the Ss' verbal knowledge and their ability to handle abstract concepts was measured.

Hypotheses II and IV were dependent upon the assumption that the impact of the two interviews would favour greater arousal of situational anxiety in the Personal Interview than in the Impersonal Interview Thus the Ss were asked to report their reaction to the interview they were given after it was over to ensure that this difference in treatments was as expected.

Hypotheses III and IV were dependent upon the assumption that all measures of vocabulary diversity were equivalent, and an intercorrelation of these measures was performed on the data to validate such an assumption.

METHOD

Subjects and Design:

40 female Ss were selected from a volunteer population (143 students) of 1st and 3rd year female students at the University of Victoria. The selection was made on the basis of their scores on the MAS (see Appendix). The distribution of MAS scores was slightly skewed toward the high scores, the median score being 21. Ss were drawn from the upper 19 and lower 23 percentiles. LA Ss had scores from 2 to 13 and HA Ss had scores from 32 to 45. This method of S selection was intended to provide the experiment with Ss differing in their predispositional anxiety.

The experiment was cast into a 2 X 2 factorial design. Within the HA and LA groups, individuals were randomly assigned to either the Personal or the Impersonal Interview. These two interview situations were designed to differ in their anxiety arousing potential (situational anxiety). The four experimental conditions were: HA Ss given the Personal Interview (H-P); HA Ss given the Impersonal Interview (H-I); LA Ss given the Personal Interview (L-P); and LA Ss given the Impersonal Interview (L-I). While initially the experiment involved 40 Ss, because of an error in the random assignment of Ss to each cell, only 36 were used in the final analyses. Consequently there were 9 Ss in each cell.

Procedure.

Ss qualifying as HA and LA on the MAS were invited to participate further in the research. Beyond the administration of the MAS, each S was involved in an interview session, followed by three

post-experimental measures. The entire experimental involvement for each S was about 45 minutes.

Description of the Interviews:

Situational anxiety was manipulated by exposing the Ss to either of two different interview conditions. The two interview treatments are described as 1). Personal, a maximally anxiety arousing interview and 2). Impersonal, a minimally anxiety arousing interview. The anxiety arousing potential of each of these interviews was based on the degree of personal involvement demanded of the S participating in the interview. In both interviews the Ss were asked 10 questions dealing with their experience as women in university. The introduction to the interviews and the subject area of the 10 items in each of them was identical for the two interview conditions, except that in the Personal Interview the second person singular pronoun was used in direct reference to the S, who was also encouraged to give her own personal opinions and to draw from her own personal experience. In the Impersonal Interview, the S was instructed to act as a representative of university women in general, and to avoid personal references, the third person pronouns (she, they) were used in presenting the questions and the S was told that she did not have to give personal answers to the items. A copy of the instructions and items used in the two interviews is included in the Appendix.

In order to obtain speech samples of the English language as free as possible from contamination by interfering stimuli beyond the stimuli presented by the interview items themselves, the experimenter limited her participation in the interview generally to the

reading of the introduction and the presentation of each of the items. In those few instances when the experimenter interjected with conversation or talked beyond a requested reiteration of the interview item, the S's responses after such interjections were excluded from the word counts and other verbal analyses. The interviews were tape recorded at 3 3/4" per sec. on a Wollensak portable tape recorder which was in plain view on the table at which the interview was conducted. Each of the tape recorded interviews was transcribed to a typed copy which was then corrected with two subsequent listenings by the same individual who made the initial transcription. Thus the language samples obtained may be described as written reproductions of the spoken language.

Post-experimental measures:

After the interview, each S was given the following tasks; 1). The Shipley Hartford Institute of Living Scale, which contains both a recognition vocabulary and abstractions subtest. It was administered immediately after the interview. Each S was given a limit of 10 minutes on each subtest. The scores from these subtests were used later to determine the possible interference of Ss' ability to handle abstract concepts and their verbal knowledge on their verbal productivity and vocabulary diversity within the interview situations.

2). The S was asked to evaluate the interview on a three point scale. She was to decide whether she felt 1). comfortable and relaxed, 2). comfortable part of the time and uncomfortable part of

the time or 3). uncomfortable and strained. This information was used to assess the relative success of the two interview conditions.

Verbal Measures:

While the two basic measures used in the study were measure of productivity (mere number of words) and the measure of vocabulary diversity (TTR) some variations of these basic measures and additional measures were applied to the data. These measures are described briefly below:

1). TTR. This is the number of different words in the speech sample (types) divided by the total number of words in the sample (tokens).

2). MSTTR. This measure is found by dividing the sample into equal sized segments, figuring the TTRs for each segment and then finding the mean TTR for the entire sample by dividing the sum of the segmental TTRs by the number of segments. The segment size used in this study was 100 words.

3). log TTR. This is found by dividing the logarithm of the number of types by the logarithm of the number of tokens.

4). Yule's K. This measure was described in the Introduction.

5). Herdan's v_m and v_m2. This measure was also described in the Introduction.

6). The mean of mean type length. This is the average number of types in each 100 token unit calculated over the entire sample.

7). The number of types (n). This was used as a crude measure of vocabulary diversity and is simply the number of different words in

a speech sample.

8). The number of tokens (N). This was used as the measure of productivity and is essentially the total number of words a speaker uttered throughout the entire interview.

9). Skewness. (McNemar, 1962). This is a measure of the degree to which a distribution deviates from the normal and in this study was performed on the word frequency distributions within Ss only.

10). Kurtosis. (McNemar, 1962). This is the measure of distribution concentration or peakedness of the distribution and again was performed only on the word frequency distribution within Ss.

Methods of analysis:

All of the words in each interview, with the exception of those mentioned earlier, were coded for computer analysis (Wachal and Edge, LEXDIV, a program to analyze lexical diversity, Canadian National Health Grant #609-7-176, Victoria, 1968). The measures of vocabulary diversity and verbal productivity gathered from each S's speech sample were submitted to analyses of variance for a 2 X 2 design (with cells of equal n). Two tailed tests of significance were used for all statistical analyses, levels of significance for X^2 and F taken from Edwards (1967) and those for r taken from Guilford (1956).

Simple correlations (i.e., Pearson product-moment coefficient of correlation) were used to analyze the relationships between:

1). the various measures of vocabulary diversity to determine the extent to which these measures are interdependent.

2). each S's diversity and productivity measures and her scores on the subtests of the Shipley Hartford Institute of Living Scale (vocabulary and abstractions) to determine the extent to which

the subject variables of vocabulary knowledge and of ability to handle abstract concepts might obscure the effects of predispositional and situational anxiety on the verbal measures.

The Ss' subjective analysis of their feelings during the interviews reported on the three point scale mentioned earlier was analyzed using Chi Square.

Except for the MSTTRs and the mean of the mean type length, the dependent variables in this study were computed from the entire speech sample for each subject. The MSTTRs and the mean of the mean type length were computed from speech segments of 100 words in length and consequently each sample was rounded off to the nearest 100's. In calculating these two variables, the speech samples suffered a loss from 99 to 8 words. However, since the very segmentation in the calculation of these measures was meant to control for sample size, it was not believed that the loss of these extra words would seriously affect the outcomes of various statistical analyses.

RESULTS

Findings Related to Hypotheses I and II: Verbal Productivity.

The interviews elicited free speech samples from the Ss that varied from 2649 words (produced by a HA S given the Impersonal Interview) to 408 words (produced by a LA S given the Personal Interview). The mean number of words produced in each of the experimental conditions are as follows:
HA Ss in the Personal Interview = 1051; HA Ss in the Impersonal Interview = 1254; LA Ss in the Personal Interview = 910; and LA Ss in the Impersonal Interview = 958. While HA Ss tended to emit more words than LA Ss this difference did not reach statistical significance ($F = 2.10$; $df = 1, 32$; $p > .05$) and the number of words emitted during the Personal Interview did not differ significantly from the number of words emitted during the Impersonal Interview ($F = 1.11$; $df = 1, 32$; $p > .05$). The interaction between predispositional anxiety (Ss) and situational anxiety (Interviews) was not significant ($F < 1$). The summary of this analysis of variance is presented in Table 1.

Findings Related to Hypotheses III and IV: Vocabulary Diversity.

The mean number of types produced in each of the experimental conditions were as follows: HA Ss in the Personal Interview = 294.0; HA Ss in the Impersonal Interview = 336.66; LA Ss in the Personal Interview = 274.22; LA Ss in the Impersonal Interview = 293.22 Inspection of the raw data did hint of a greater number of types in the speech samples of the HA Ss in both interviews with the

TABLE I

Summary Table of the Analysis of Variance of Verbal Productivity - Number of Words Uttered by Each Subject

Source	df	Sums of Squares	Mean Squares	F
Between Subjects-Anxiety (H & L)	1	458239.55	458239.55	2.097
Between Interviews-Treatments (P & I)	1	171418.78	171418.78	1.113
A X T Interaction	1	225200.00	225200.00	1.046
Within Groups	32	4928167.42	154005.23	
Total	35			

Criterion F values, df = 1/35; $p < .01 = 7.56$; $p < .05 = 4.17$

Impersonal Interview eliciting more different types in both S groups. However, these differences between Ss (F = 1.59; df = 1, 32; $p>.05$) and Interviews (F = 1 52; df = 1, 32; $p>.05$) did not prove to be statistically significant. The interaction between predispositional anxiety (Ss) and situational anxiety (Interviews) was not significant ($F<1$). The summary of this analysis of variance is presented in Table 2.

One of the major measures of vocabulary diversity used in this experiment was the MSTTR. The cell means for this variable were: HA Ss in the Personal Interview = 0.62832; LA Ss in the Personal Interview = 0.63086; HA Ss in the Impersonal Interview = 0.64106; LA Ss in the Impersonal Interview = 0.65034. The differences between Ss and interviews for this measure did not reach significance although there was a sizeable difference between interviews (F = 3.49; df = 1, 32; $p>.05$; $p<.05$ = 4.15). The summary of this analysis of variance is presented in Table 3.

However, 8 of the 11 measures of vocabulary diversity did result in significant values in the analyses of variance. The F values of these analyses are presented in Table 4.

While TTR and the log TTR did not produce the expected difference between interviews these measures were significantly sensitive to differences in vocabulary between Ss (TTR, F = 4.60; Log TTR, F = 5.19; df = 1, 32; $p<.05$). The difference was, however, in a direction opposite to that expected; the suggestion was of greater diversity in the vocabularies of the LA Ss than in those of the HA Ss.

TABLE 2

Summary Table of the Analysis of Variance of the Number of Different Types Uttered by Each Subject

Source	df	Sums of Squares	Mean Squares	F
Between Subjects-Anxiety (H & L)	1	8993.36	8993.36	1.59
Between Interviews-Treatments (P & I)	1	8556.25	8556.25	1.52
A X T Interaction	1	1260.25	1260.25	0.20
Within Groups	32	180626.93	5644.59	
Total	35			

Criterion F values: df = 1/35; $p<.01 = 7.56$; $p<.05 = 4.17$

TABLE 3

Summary Table of the Analysis of Variance of the Mean Segmental Type-Token Ratio

Source	df	Sums of Squares	Mean Squares	F
Between Subjects-Anxiety (H & L)	1	0.00031	0.00031	0.46
Between Interviews-Treatments (P & I)	1	0.00234	0.00234	3.49
A X T Interaction	1	0.00010	0.00010	0.15
Within Groups	32	.02152	.000672	
Total	35			

Criterion F values: df = 1/35; $p<.01 = 7.56$; $p<.05 = 4.17$

TABLE 4

Summary Table of the Analyses of Variance for
Measures of Vocabulary Diversity

		Dependent Variables							
Source	df	TTR	Log TTR	Skewness	Kurtosis	v_m	$v_m 2$	Yule's K	Mean Type length
Between Subjects Anxiety (H & L)	1	4.60*	5.19*	0.99	1.34	1.64	1.42	1.25	0.54
Between Interviews (P & I)	1	0.00	0.19	23.46**	22.80**	22.73**	22.04**	18.31**	7.233*
A X I Interaction	1	0.25	0.25	0.11	0.63	0.11	0.07	0.06	0.16
Within (Mean Squares)	32	.00172	.000166	.52595	155.2025	.36015	153.9269	229.36613	.009306
Total	35								

F Values from the Analyses of Variance of Measures of Vocabulary Diversity with Mean Squares for Within Groups Variation.
Criterion F Values: df = 1/32; $p<.01 = 7.50^{**}$; $p<.05 = 4.15^{*}$.

All of the other significant measures of vocabulary diversity showed a difference between interviews but did not produce the expected differences between Ss. None of these measures reflected a significant interaction between Ss and interviews ($F<1$). Figure 1 is a graphic representation of the cell means for all these statistically significant variables. It shows that for v_m, v_m2 and Yule's K, the Personal Interview resulted in less vocabulary diversity than the Impersonal Interview, recalling that increases in these measures reflect redundancy in the word samples. Again this was contrary to expectation. However, all of these differences were highly significant ($F = 7.50$; $df = 1, 32$; $p<.01$). The mean of the mean type length was also significantly different for the interviews ($F = 7.233$; $df = 1, 32$; $p<.01$). Figure 1 shows that the difference was again opposite to that expected; the type length was greater (indicating more rare words) in the Impersonal Interview than in the Personal Interview.

Measures of skewness and kurtosis also demonstrated an unexpected redundancy in the interview considered the most potent in situational anxiety, the Personal Interview. Values of skewness for all the speech samples were positive, indicating that the means of all of the given word frequency distributions lay to the left of the mean of a normal distribution. However, the values for the skewness of the word distributions of those Ss given the Personal Interview were significantly more positive ($p<.01$) than for those of Ss given the Impersonal Interview. Likewise all values for kurtosis were positive showing that all of the word frequency distributions were more peaked (leptokurtonic) than normal, hence reflecting relative redundancy.

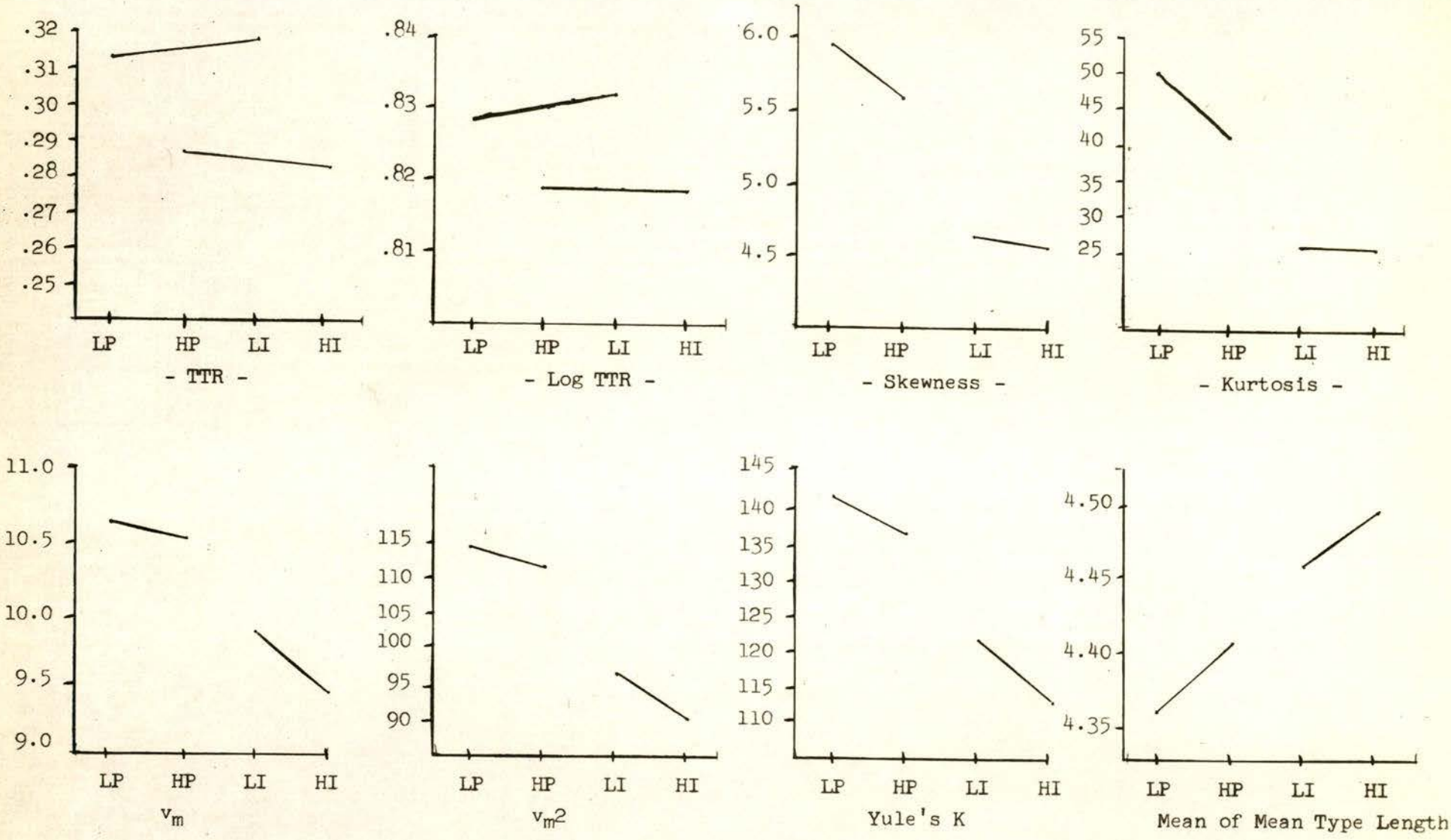

FIGURE 1. Graphic Representation of the Cell Means of the Statistically Significant Measures of Vocabulary Diversity. The cells are identified as follows: LP = Low Anxious Ss in Personal Interview; HP = High Anxious Ss in Personal Interview; LI = Low Anxious Ss in Impersonal Interview; HI = High Anxious Ss in Impersonal Interview. The graphs for the TTR and Log TTR are drawn to emphasize the difference between High and Low Anxious Subjects while the other graphs are drawn to emphasize the difference between Personal and Impersonal Interviews.

Again the values for kurtosis were significantly more positive ($p<.01$) for the Personal than for the Impersonal Interview.

Examination of the Possible Contamination of Results by Additional Subject Variables.

The two primary S variables explored in this study outside of manifest anxiety were 1). verbal knowledge measured by the Shipley Hartford Institute of Living vocabulary subtest and 2). ability to handle abstract concepts measured by the Shipley Hartford Institute of Living abstractions subtest. There was no statistically significant relationship between performance on the Shipley Hartford Institute of Living vocabulary subtest and the MAS ($r = -0.1444$; $p>.05$). There was only a slight negative relationship between the Shipley Hartford Institute of Living abstractions subtest and the MAS ($r = -0.2574$; $p>.05$). This latter correlation indicates that as performance on the abstraction subtest increased the measured anxiety decreased.

A number of correlations were performed among the three key S variables (MAS score; SIL Verbal score; SIL Abstractions score) and four dependent variables, namely, total number of words, MSTTR, mean of mean type length and the log TTR. These correlations were calculated first of all for all Ss and then for HA and LA S groups. The results are presented in Table 5.

For all Ss there was a slight positive ($p>.05$) correlation between MAS score and the total number of words produced

TABLE 5

Correlations Between Subject Variables and Verbal Measures

Subject Groupings		Subject Variables	Measures of Verbal Productivity & Diversity: Total No. of words	MSTTR	Mean of mean Type Length	Log TTR
	All Ss	MAS score	0.2734	-0.0845	0.0323	-0.3871*
		SIL Verb. score	0.1183	0.2746	0.0985	0.1102
		SIL Abst. score	0.2190	0.1212	0.1231	-0.1145
	High Anxious	MAS	0.1447	0.3178	-0.1801	0.1387
		SIL Verb.	0.1376	0.4141**	0.2185	0.1692
		SIL Abst.	0.3637*	0.2354	0.3626*	-0.2912
	Low Anxious	MAS	-0.2128	-0.2547	-0.5537**	0.0419
		SIL Verb.	0.2966	0.1069	0.0473	-0.0337
		SIL Abst.	0.2244	-0.2073	-0.2213	-0.2044

Pearson's r's for selected subject variables and four measures of verbal productivity and vocabulary diversity. Criterion values for r at 5% level, 0.325,* and at 1% level, 0.418.**

during the interview, and a negative correlation ($p<.05$) between the MAS score and the log TTR. There was also a positive correlation ($p>.05$) between SIL vocabulary scores and the MSTTRs. The SIL Abstractions scores had a modest positive ($p>.05$) relation to the productivity measure, total number of words. However, the only significant relationship was between the MAS and TTR.

For HA Ss, MAS scores' positive relationship with MSTTRs approached significance ($p>.05$). SIL Verbal scores were positively related to MSTTRs ($p<.01$) but the relationship between this subject measure and the mean of the mean type length only approached significance ($p>.05$) in the positive direction. SIL abstraction scores were positively related to total number of words ($p<.05$), and mean of mean type length ($p<.05$), but the suggestion of a positive relation between this measure and the MSTTR and a negative relation with the log TTR did not reach significance ($p>.05$).

For LA Ss MAS scores were negatively related to mean of mean type length ($p<.01$) but the suggestion of negative relationships between this measure and total number of words and MSTTRs did not reach a significant level ($p>.05$). None of the remaining correlations produced significant values, although there was a suggestion of a positive relationship between SIL Verbal scores and total number of words, and a tendency for SIL Abstraction scores to be positively related to total number of words and negatively related to MSTTRs, means of mean type length and log TTRs.

Examining the Differential Impact of the Two Interviews.

An examination of the relative effectiveness of the two different interviews via the self report from each S gathered at the end of the interview showed that the majority of the Ss felt strained during the Personal Interview and relaxed during the Impersonal Interview ($\underline{X}^2 = 4.05$; $\underline{df} = 1$; $p<.05$). Thus, considering all 36 Ss, 5 felt relaxed during the Personal Interview while 13 felt strained in that situation, and during the Impersonal Interview 11 felt relaxed and only 7 felt strained.

When the Ss were separated into HA and LA groups, it was seen that the HA Ss' reaction to the different treatments were essentially unpredictable ($\underline{X}^2 = 0.00$), while the LA Ss quite consistently felt uncomfortable during the Personal Interview and relaxed during the Impersonal Interview ($\underline{X}^2 = 8.10$; $\underline{df} = 1$; $p<.01$). Considering the LA Ss, 8 reported that they felt strained during the Personal Interview and only 1 reported that she felt relaxed. In the Impersonal Interview, 7 said they felt relaxed and only 2 that they felt strained. Raw data used in this analysis are presented in Table 6.

The Interrelationship of the Measures of Vocabulary Diversity.

A correlation across all Ss among the major dependent variables related to vocabulary diversity produced results summarized in Table 7. It was expected that since all of these

TABLE 6

Subjects' Evaluations of Their Response to the Different Interviews

Ss		Low Anxious		High Anxious	
Eval.		Relaxed	Strained	Relaxed	Strained
INTERVIEWS	Personal	1	8	4	5
	Impersonal	7	2	4	5

Chi Square contingency tables for analyzing the differential impact of the two interviews (Personal and Impersonal). The X^2 for the Low Anxious Ss was 8.10 and that for High Anxious Ss was 0.00 (df = 1, X^2 = 6.635, $p<.01$; X^2 = 3.841, $p<.05$). The X^2 for all Ss (i.e., High and Low Anxious Ss together) was 4.050.

	Log TTR	n	Skewness	Kurtosis	v Sub m	v Sub$_{m}$2	Yule's K	MSTTR	Mean of Mean Type Lengths
TTR	.95106**	-0.67970**	-0.17968	-0.11438	-0.11038	-0.0943	0.05773	0.28521	-0.14451
Log TTR		-0.43725**	-0.10799	-0.05927	-0.28165	-0.26687	-0.16427	0.52038**	-0.04256
n			0.26008	0.17176	-0.30822	-0.31644	-0.51284**	0.34464*	0.28178
Skewness				0.98409**	0.51015**	0.50855**	0.37013*	0.02283	-0.28027
Kurtosis					0.47745**	0.47568**	0.36075*	0.02125	-0.29133
v Sub$_{m}$						0.99885**	0.97211**	-0.64541**	-0.37241*
v Sub$_{m}$2							0.96818**	-0.64702**	-0.36224*
Yule's K								-0.69003**	-0.41159*
MSTTR									0.23864

TABLE 7. Intercorrelation of dependent variables (measures of vocabulary diversity). Criteria for significance: r at the 5% level = .325* and r at the 1% level = .418**, df, 35.

measures reflect vocabulary diversity that they would be related, but the statistical depth (i.e., exact degree of significance) of the relationship was not predicted. Results, however, did not support unequivocal relationships between all of the measures even though they may be considered as measuring the same facet of vocabulary. Reference to Table 7 shows that there were three clusters of measures: 1). The TTR and log TTR are strongly positively related ($p<.01$). They share a negative relationship with number of types (n) ($p<.01$); that is, as the number of types increases the TTR and log TTR decrease. Other than the log TTR being positively related to the MSTTR ($p<.01$), these measures did not prove to be related significantly to other measures of vocabulary diversity. 2). Skewness and kurtosis are strongly positively related ($p<.01$). They share positive relationships with v_m, v_m2 ($p<.01$) and Yule's K ($p<.05$). However, there was an unexpected absence of any relationship between these measures and the TTR, log TTR, n, MSTTR and mean of mean type length. 3). v_m, v_m2 and Yule's K are positively related to each other ($p<.01$) and share a negative relationship with the MSTTR ($p<.01$) and the means of the mean type length ($p<.05$). In the case of these negative relationships, as v_m, v_m2 and Yule's K increase both the MSTTR and the mean of the mean type length decrease. As was mentioned above, these three measures are positively related to skewness and kurtosis. Besides Yule's K being related to n ($p<.01$) these measures were not significantly related to the other measures of vocabulary diversity.

DISCUSSION

Examination of the results shows that none of the major hypotheses tested received positive support in this study. In the case of the measure of verbal productivity, neither the difference between Ss nor that between Interviews reached significance. In the case of the measure of vocabulary diversity, when significant differences emerged between Ss or Interviews these differences proved to be in directions opposite those predicted.

Since these hypotheses were generated from Spence's (1958) theory of emotionally based drive and were based on the present author's assumption that the verbal behaviour considered here was equivalent to those simple behaviours from which Spence had obtained support for his theory, it was felt that this basic assumption should be re-examined. This then calls for a restatement of hypotheses and a re-examination of results in the light of a more complex level of behaviour than was originally assumed. It is also possible that the characteristics of the dependent variables and the complexity of various personality factors had their part to play in the unexpected turn of the results. Because it is believed that these issues have a bearing on all of the stated hypotheses, the discussion that follows will center on the issues just mentioned rather than treating the hypotheses individually.

RE-EXAMINATION OF BASIC ASSUMPTIONS AND SPENCE'S THEORY

The predictions which were made from Spence's theory of emotionally based D were nullified by all of the significant differences found between both Ss and interviews. In the case of the TTR and log TTR, which were sensitive to differences between HA and LA Ss, the difference was that of greater vocabulary diversity in the speech samples of the LA Ss and more redundant vocabularies in the speech samples of the HA Ss. The prediction was that the HA Ss due to their greater level of arousal would produce more diverse vocabularies. Those measures betraying differences between the two interviews disclosed greater vocabulary redundancy among Ss given the Personal Interview rather than the expected result of greater breadth of vocabulary in that interview. This conflict between predictions and results may have been due to an under-estimation of the complexity of the verbal demands of the two interviews and the possibility that both of the interviews used were really of a complex nature. If this characterization of the tasks as complex had been assumed then the obtained results would have added support to findings that HA Ss perform more poorly at least initially on complex tasks than do LA Ss (Spence and Spence, 1966). This would have meant describing both of the interviews as complex and also specifying that poor performance is implicit in relatively low TTRs and log TTRs or at least evidence in these measures that Ss produced less diverse vocabularies. This in turn is tied to the assumption that a high TTR and log TTR is indicative not only of greater diversity in the language sample but a greater breadth of information in the communication.

It may well be the case, however, that verbal behaviour even of the simplest sort inhabits a realm of complexity that cannot be compared with other more automatic behaviours such as the eyeblink. However, Siegman and Pope (1966) had made predictions similar to those made in this present research also based on the assumptions that the language demands were simple and that the anxiety aroused was minimal.

This suggests also that the predictions made from Spence's theory need to be restated in light of this altered assumption. It may be recalled that Spence expanded his theory to include hierarchies of responses and that he said increased drive leads not only to more responses but also to the increased probability that the more habituated responses (or responses lower in the hierarchy) would be elicited. Predictions of the outcomes for this experiment had been based on the assumption that the verbal responses elicited in the interviews were all equally low in the potential response hierarchy. This assumption was made because it was not believed that the interviews would be particularly cognitively demanding. Had the complexity of verbal behaviour been admitted, and had Spence's response hierarchy been applied to this situation, then the predictions may well have been for greater verbal productivity with increased drive coupled with a reduction of less common responses and hence less vocabulary diversity.

This more sophisticated view of Spence's theory of anxiety and of verbal behaviour would have resulted in more harmony between predictions and results as far as productivity and the TTR and log TTR are concerned. Reference to the results hinted that there was greater verbal productivity among the HA Ss than the LA, although the difference

between the means did not reach significance. Inspection of the results regarding the TTR and log TTR shows that the HA Ss had more redundant vocabularies in spite of speaking more words. On the other hand it must be recognized that this latter result could well be an artifact of these two dependent measures. Researchers in the past have found that the TTR is highly sensitive to sample size and the log TTR only controls for the effects of sample size imperfectly. The possible contamination of results due to the limitations of the dependent variables will be discussed at greater length later.

It should also be mentioned that while the differences again were not significant there was some suggestion of a larger number of types in the vocabularies of the HA than in those of the LA. Again, however, this difference is probably a reflection of the larger samples of the HA Ss. The mean segmental TTR suggested that there was less overall vocabulary diversity among the HA than among LA, and since this measure places stricter controls on the fluctuations of sample size, is thought to mirror the actual differences between the two S groups with more integrity. Still it must be re-emphasized that the only measures that were significantly sensitive to differences between Ss were the TTR and the log TTR.

The experimental manipulation of the difference between the two interviews produced the most significant results but again the direction of the difference was opposite to that expected. It had been speculated that the Personal Interview would be the most anxiety arousing and thus would generate the most productive speech samples and the vocabularies of the greatest diversity. However, the implication of the productivity measure,

while nonsignificant, was of larger word samples in the Impersonal Interview than in the Personal and the number of types was lower for the Personal Interview as was the MSTTR. Those measures that were highly significant showed more definitely that there was a greater diversification of vocabulary during the Impersonal Interview than the Personal Interview. Again this dissonance between findings and results may be explained through a re-examination of Spence's theory and the consequent expectation that the most anxiety arousing interview (the most drive inducing) would be plagued with more words to be sure but more words of the same type. This alteration of predictions via a more careful interpretation of Spence's theory does not account for the results regarding Interviews as neatly as it does for results regarding Ss. For, in the case of Interviews, an apparent reduction in productivity was paired with redundancy in vocabulary. In this same context it is of interest to consider the Ss' subjective report of their feelings during the two interviews recalling that they felt more uncomfortable during the Personal Interview than during the Impersonal Interview. In light of this one would need to consider either a debilitating view of anxiety beyond that offered by Spence or a re-examination of the two interviews not only in terms of their anxiety arousing potential but in terms of their informational demands.

Consideration of the view of anxiety as debilitating moves outside of Spence's theory into theories such as that articulated by Osgood (1960). Siegman and Pope (1966) in discussing the inconsistencies between the results of studies dealing with anxiety and behaviour offer an explanation that they felt could be applied to the conflicts between these results. This was the inverted U effect (Duffy, 1962). This

model assumes that the activating effects of anxiety are beneficial up to a certain level of arousal, releasing otherwise subthreshold responses and augmenting behaviour. But it also recognizes an optimal level of arousal and beyond this point responses become confused, some being inhibited and others overworked. The difficulty with this explanation is the definition of the optimal level of arousal and while such an explanation may be applied to the data obtained here it is even more evasive than re-evaluating Spence's theory or considering the fallibility of the measures used. Furthermore it does not offer the researcher a concrete basis for making future predictions.

Spence and Spence (1966) had also numbered Duffy's (1957) explanation among those drive theories that are dependent upon physiological measures of anxiety. They preferred to identify Spence's approach as a mathematical drive theory which then does not obligate increased drive to follow in the shadow of appropriate increases in physiological indexes. Besides selected physiological indexes of anxiety have in the past only borne very weak correlations with other measures of level of arousal. In fact, as was mentioned in the introduction, Dibner (1956) found that his verbal measures of anxiety in speech were more highly correlated with clinicians' global ratings of anxiety and patients' self ratings than with the Galvanic Skin Response. This is why for the purposes of this research some explanation for the discordant results is sought in Spence's theory or in the structure of the present research rather than retreating to an explanation such as that offered by Duffy.

Siegman and Pope (1962) have indicated that verbal productivity may not only be affected by anxiety but also by the informational demands

of the situation or, more specifically, by the ambiguity or specificity of the questions asked. They found that the specificity of the interviewer's questions and remarks was inversely related to the interviewee's verbal productivity (measured in clause units). It is of interest in the present study that while the Personal Interview was identified as the most uncomfortable by the Ss that some of the Ss given the Impersonal Interview while not feeling uncomfortable in that situation volunteered the information that they found the questions in the Impersonal Interview difficult to answer. Their reason for saying this was that the questions were so general they didn't know exactly what was required to answer them and that it would have been easier had they felt free just to talk about their own experiences and opinions. Since in the Impersonal Interview Ss were asked to act as representatives of university women in general the same amount of structure was not imposed on their responses as on those of Ss given the Personal Interview who were asked explicitly to talk about their own personal opinions and experiences. However, a record of such comments was not kept and therefore statistical conclusions cannot be drawn from them other than they might at least suggest the importance of the specificity-generality factor in the matter of verbal communication. Future investigations of this type might well keep a record of the Ss' overall appraisal of the informational demands of the experimental treatments as well as a record of their feelings about the anxiety arousing potential of the treatments.

The generality-specificity factor might well account for the fact that Ss generally talked more during the Impersonal Interview and the speech samples in that interview were more diverse in their

vocabularies. It is almost as if the lack of direction in that interview resulted in more verbal wandering, and the S' attempt to act as a representative of university women in general led to her verbalizing about more different Ss than she would have had she simply talked about her own personal experiences.

Siegman and Pope (1966) offered a conceptualization of the interview as an informational exchange system with interviewer ambiguity-specificity as the crucial variable in interviewee output. They had stated that:

> The more ambiguous an interviewer's remark is the fewer the limitations on the range of the interviewee's informational input and hence the greater his productivity...On the assumption then that ambiguous interviewer remarks, in contrast to specific remarks, provide the interviewee with greater latitude for informational input, it is hypothesized that interviewer ambiguity will be associated with interviewee vocabulary diversity. (p.242)

Their own findings were that greater ambiguity results in greater verbal productivity (Pope and Siegman, 1965a) and more vocabulary diversity (measured by MSTTRs) (Siegman and Pope, 1966) in the speech samples of the interviewees. However, while the means for the productivity measure in the immediate research suggested differences in a direction that could be explained by this tactic, they were not significantly different. Still the startline difference in the diversity measures for the two interviews does merit explanation and it would seem equally valid to explain this difference either by recognizing the deleterious effect of the Personal Interview within the confines of the revised view of Spence's theory or by recognizing the greater informational demands of the Impersonal Interview.

If the first explanation is accepted then the greater redundancy of the speech samples of Ss in the Personal Interview might be considered the expression of the increase in verbal responses lower in the hierarchy of available verbal responses. If the second explanation is favoured then the greater information demands of the Impersonal Interview are called to account for the more diverse vocabularies produced in that treatment. However, anxiety or its absence cannot be clearly separated from response to the informational demands of the situation in this research. It might well be the fact that Ss feeling more relaxed during the Impersonal Interview became more verbally facile. But these findings do suggest that the clinician might well be aware that his client may not only be verbally crippled by the anxiety he is experiencing in the interview but also because of confinement he might feel as a result of highly specific, constricting remarks and questions imposed on him by the clinician.

IMPACT OF THE DEPENDENT VARIABLES ON RESULTS

It is obvious that a change in theoretical orientation does not resolve all of the conflicts among findings satisfactorily. Some of these conflicts seem to arise out of the characteristics of the dependent variables used. Thus, in order to appreciate some of the difficulties in harmonizing results, the differences among these measures must be considered. For the results of the intercorrelational study among the measures of vocabulary diversity show that while it was initially assumed that they were measuring the same facet of speech, they do not do it in the same way and consequently are not necessarily related to each other. All of the measures used in this study deserve

some scrutiny either to find an explanation for why they did not contribute to positive results or when they did, why they might have contributed at differing degrees of intensity.

To begin with, neither the productivity measure (total number of words) nor the basic diversity measure (number of types or different words) produced significant results. This may well substantiate the crudity of such gross measures and be due to the fact that the first is easily corrupted by many nonverbal phenomena while the latter is victimized by sample size. However, the insensitivity of the productivity measure cannot be used as the only excuse for nonsignificant results in this study because it had managed to discriminate significantly between treatments in the Siegman and Pope (1965) investigation. One explanation for this disparity in the results of this study and those in that of Siegman and Pope (1965) could lie in the fact that both of the independent variables in their study were situational in nature (anxiety arousal and ambiguity) while in the present study one of the independent variables was a S difference and the other a situational manipulation. It is possible that productivity is affected more by situational factors than it is by individual differences and in the present study its impact in the two treatments was obscured by the lack of clear difference in productivity between HA and LA Ss.

The failure of the diversity measure, number of types to reach significance may be a reflection of the impact of sample size on this measure. Had the verbal productivity measure been significant, it is likely that this measure would have reached significance also. Sample size does not explain the fact that the MSTTR did not glean significant

results. This measure is supposed to control more efficiently for variation in sample size. It is interesting to note, however, that the direction of differences was in favour of higher MSTTRs in the Impersonal Interview which is in keeping with the implied direction of both the productivity measure and number of types. On the other hand the difference in the means for the Ss seemed to hint of a lower MSTTR for the HA Ss; this might well be considered an indication that the MSTTR is relatively independent of sample size and number of types.

Among those measures which did produce statistically significant results, it was observed that the measures reflecting the nature of the word frequency distributions, i.e., skewness and kurtosis, showed that the word frequency distributions were more positively skewed and peaked for the Personal Interview. This seems to suggest that the Personal Interview, by reason of its greater specificity in verbal content, produced a more restricted verbal universe. Hence more of the same words were used more of the time and fewer low frequency words were introduced in that condition.

Consideration of the other measures used in this study suggests that while certain measures of diversity may have been thought equivalent to each other, they bear some unique characteristics and thus react differently to treatment effects than they do to S effects. For example, the only measures which were significantly sensitive to differences between HA and LA Ss were the TTR and log TTR which were positively related to each other ($p<.01$). It is curious that both of these measures are negatively related to number of types but this might

be explained by the fact that number of different words increases with the size of the sample and as sample size increases both the TTR and to some extent the log TTR decrease. Thus this negative relationship may not be so much with number of types as with the sample size which number of types reflects. The findings that the log TTR and MSTTR were positively related to each other while the MSTTR was but weakly, positively related ($p > .05$) to the TTR is probably due to the fact the log TTR and MSTTR control the influence of sample size more effectively than does the TTR. Also the fact that the TTR was more blatantly related to number of types ($r = -.67970$) than was the log TTR ($r = -.43725$) is another indication that the latter measure does control for that interfering variable. Thus these two measures, TTR and log TTR, appear to be viable measures of vocabulary diversity and to be particularly sensitive to S differences in verbal productions.

v_m, $v_m 2$ and Yule's K were positively related to each other and to both skewness and kurtosis, but they were negatively related to MSTTR and mean of mean type length. Examination of v_m, $v_m 2$ and Yule's K shows that as vocabulary diversity increases they decrease. In fact, in their respective formulae more frequent words are more heavily weighted than less frequent words and words that occur only once in a speech sample are disregarded altogether (Wachal, 1966). These measures then may be considered more measures of vocabulary redundancy than of vocabulary diversity. Hence the finding that the Personal Interview resulted in higher values for these measures indicates the more restricted verbal universe of that interview. The fact that Yule's K was negatively related to number of different words is simply

an indication that as redundancy increases, number of different words decreases. Number of different words was also negatively related to v_m and v_m2 but not significantly so. The strength of the relationship between v_m and v_m2 is simply due to the redundancy of these two measures. The fact that they are negatively related to both the MSTTR and mean type length indicates again that they are more accurately described as measures of vocabulary redundancy.

Mean type length (or the length of the words used) is a measure that gauges the rareness of the words used in a speech sample, assuming that longer words are rarer and hence do not occur as often in a language sample. The fact that it was not significantly related to either major measure of vocabulary diversity raises the question whether this is really a measure of diversity. Its strong negative relationship to the measures of vocabulary redundancy indicates that it cannot be paired with those measures. Still it was another of the verbal indices which was sensitive to differences between Interviews but not between Ss and so is thought to measure variety in vocabulary in yet a different way. Perhaps it would be best described as a measure of vocabulary uniqueness. It showed that there were fewer unique words emitted during the Personal Interview than during the Impersonal Interview and may again speak for the difference in the verbal parameters of the two interviews. Its lack of relationship to the TTR and log TTR may be explained by the fact that these measures are dependent ultimately for their magnitude upon the number of different words in a speech sample, while the magnitude of the mean type length is dependent upon the length of the different words used. It is feasible that a given individual might use more long

words more often in a speech sample and that this length does not really reflect the dispersion of the words he chooses. It is felt that even though mean type length was sensitive to differences between speech samples emitted during the two interviews favouring longer words in the Impersonal Interview that it is more accurately described as a measure of vocabulary uniqueness being reserved in its applicability as a measure of vocabulary diversity.

IMPACT OF PERSONALITY VARIABLES ON RESULTS

While situational variables had profound effects upon the verbal measures, personality factors also made an impact on the results. Siegman and Pope (1965) had found a positive correlation between verbal productivity and scores on Bendig's short form of the MAS ($r = .31$) and while the correlation between productivity and the form of the MAS used in the present research was not significant it was in the same direction as that in the Siegman and Pope study ($r = .2734$). Thus there does seem to be a relationship between Manifest Anxiety and verbosity and it seems to be toward an increase in verbalizations with increases in measured anxiety. However, anxiety is not all that contributes to verbal productivity. When Ss were separated into groups according to their MAS scores and then the two other S variables (i.e., verbal knowledge and ability to handle abstractions) compared to productivity it was found that for the HA the strongest correlation was between their ability to handle abstract concepts and productivity ($r = .3637$). For the LA the strongest correlation was between their vocabulary range and their verbal productivity ($r = .2966$).

While Siegman and Pope had not explored any relationship

between vocabulary diversity and MAS scores, in this present study it was found that scores on the MAS were negatively related to log TTRs ($p<.05$). This seems to support the view of more redundancy with increased drive. Siegman and Pope (1966) had found a positive relationship between ability to formulate abstractions and vocabulary diversity (TTRs) while in the present study no significant relationships emerged between either the vocabulary range score or the abstractions score and the log TTR. Vocabulary range did prove to have a positive relationship with MSTTRs for HA Ss ($p<.01$). This may just be more evidence of the differential sensitivity of measures superficially considered the same. These findings may also suggest that for HA Ss verbal productivity is more the product of their ability to handle abstractions while diversity in their language (measured by the MSTTR) is more definitely related to their knowledge of the language. The fact that the vocabulary range of the HA did not have a startling relationship to the log TTR may simply be the result of the log TTR's negative relationship to number of different words and thus an indirect indicator of increase in sample size.

The uniqueness of the vocabulary (measured by mean type length) of LA Ss is negatively related to their MAS scores while it is positively related to the ability to handle abstractions in the HA. This may hint that because HA Ss are used to having their anxiety aroused their word choice in general is less affected by situationally induced anxiety--they are always anxious and therefore are not as sensitive to the treatment manipulation as the LA. This seems confirmed by the findings regarding the differential impact of the two treatments on the two S groups. The facts that the productivity measure and MSTTR and mean type length were more definitely related to vocabulary knowledge and ability to handle

abstract concepts for the HA than the LA may well indicate that the HA by reason of operating under high drive all the time have learned to cope somewhat with their increased drive and were not as disrupted by the situational distress imposed by the experiment as were the LA.

The confusion of results relative to the S variables, however, may be an indication that there are still more individual differences than those considered here contributing to the lack of significant results relative to some of the measures of productivity and vocabulary structure. It is nevertheless a fairly clear cut finding that the speech measures explored here are generally more sensitive to situational factors than they are to differences between types of individuals. Significant results from this research indicate that the speech characteristics examined may be expected to reveal the individual's reactions to the verbal demands of the moment, even if they do not clearly reflect individual differences among speakers. It certainly was the case that the most profound differences emerged in response to the experimental manipulation (Interviews) and not in response to the S variable established on the basis of the MAS. This should not be interpreted wholly as the product of the limitations of the speech measures themselves although such limitations have been recognized and discussed. It may be that there are more meaningful individual differences which might offer researchers clearer results. It is possible that situational anxiety is different from predispositional anxiety (determined via the MAS) to the extent that it cannot be explained by a theory of anxiety such as Spence's. It may have been inappropriate to assume that these two types of anxiety could be covered by that theory. In the

future investigators should consider treating these two types from different predictive standpoints. Cattell and Scheier (1958; 1961) in their factor analytic study, uncovered two types of anxiety and identified the one as trait anxiety, which is equivalent to the designation of predispositional anxiety used in this research, and state anxiety, which is comparable to the fluctuation in reactivity expected as the offspring of situational manipulation in this study. These investigators observed that while the two foci of anxiety are similar they were distinct enough from each other to emerge as two separate entities. Their independence for Cattell and Scheier was primarily due to the fact that while both factors received positive loadings from physiological variables, the loading from these factors was very strong for state anxiety but weak for trait anxiety. Thus, while physiological controls have been only minimally rewarding in studies of manifest anxiety, they might well be introduced to help clarify effects when considering situational anxiety.

HEURISTIC VALUE OF THE STUDY

When considering future research in the area of anxiety and speech the findings from this present study suggest some changes in focus as well as changes in structure that might maximize the chances of obtaining more meaningful results.

Perhaps the most blatant change in focus is the recognition that verbal behaviour cannot be readily compared with simpler, more automatic kinds of behaviours. The complexity of language production is here acknowledged. Tied closely to this is the fact that this study concentrated on the mechanics of communication as implied in the "objective-descriptive" approach; it might be more useful in the future not only to consider the structural elements in the communication but also content and meaning. Although the issues of meaning were avoided in this present research, it is recognized that they may have an important bearing on the structure of the communications. If it were possible to create a workable alliance between analyses of content and structural elements such as those used here, it might lead to controlling the interference of the variable meaning. It would seem that a recognition of the complexity of language must include the realization that meaning cannot be realistically separated from structure.

It is also possible that situational and predispositional anxiety may have to be identified as different types of anxiety or at least facets of anxiety that should be handled by different theories, the former by a physiological theory of anxiety and the latter by Spence's theory. Situational anxiety may better be accounted for by those theories that are more dependent upon the immediate reaction of the organism to stress.

Future researchers might consider altering the structure of their research to control more effectively for situational anxiety by either obtaining a measure of physiological reactions to stress throughout the verbal task or by taking periodic subjective reports of the S's level of anxiety. The interference of intelligence might be managed by using a dependable measure of that variable (i.e., Wechsler's Adult Intelligence Scale, 1955). In order to control for the interference of the ambiguity-specificity factor future studies might be constructed on the monologue rather than the controlled dialogue of the interview. It is also apparent that there is a continued need to explore various dependent variables in order to clarify the differential sensitivity of the growing varieties of verbal measures.

A matter of linguistic importance in the study deals with the question of whether or not the language samples analyzed can really be considered spontaneous speech samples. It is frankly admitted that a spoken language differs dramatically from its written counterpart both being based on different structures and the latter being much more stereotyped and rigid than the former. Language productions may be any one of four types - written; spoken-written, i.e., reading a written piece aloud; spoken; and written-spoken, i.e., reducing a speech sample to a conventional written form. In the present study the language sample actually analyzed was a written-spoken production and not a pure speech sample just by virtue of the fact that the experimenter did not use a phonemic approach to transcribing interviews to the typed copy and used an analysis based on the word as defined earlier (p. 7). Thus productivity in a spoken language sample in the future might better be

measured in terms of a syllable count rather than a word count. In this same context it must also be recognized that spontaneity of the speech of the Ss was corrupted by the fact that they were also asked to respond to the interview items which were actually spoken-written language productions and not exactly equivalent to pure spoken language. Such factors not only affect the number of words the Ss emit but also the words they choose and hence vocabulary diversity.

There is another linguistic matter raised by the interview items devised for this experiment. In addition to differences in the two interviews due to their different informational value, the items to which Ss were asked to respond in the Personal Interview differed in structure from those in the Impersonal Interview. Thus while general subject area was the same for both interviews, they differed markedly in the structure of the interview items. Recognizing the importance of Chomskyan theory (Chomsky, 1957) of transformations, it is the case that the structure of the stimulus (interview item) determines the structure of the S's response. Because the structure of each S's responses was dependent upon the structure of the questions she was asked, this is bound to have an effect on both the words she chose as well as the length and grammatical structure of her response. In the future the impact of different grammatical structures should be carefully controlled if not analysed.

In conclusion then, while this study enjoyed some success in defining the relationship between the speaker and his message it is obvious that there is much room for further clarification. It is apparent that future psycholinguistic studies of this nature must not

only include sensitive consideration of the psychological factors involved in language productions but include awareness of the complexities of the multitude of linguistic influences as well.

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APPENDIX

CONTENTS

TAYLOR MANIFEST ANXIETY SCALE

DATE _____ NAME _____ SECTION _____

IF THE STATEMENT DESCRIBES YOU, CIRCLE T(TRUE); IF NOT, CIRCLE F (FALSE).

T F 1. I like mechanics magazines.

T F 2. I am not at all confident of myself.

T F 3. I like to read newspaper articles on crime.

T F 4. Life is often a strain for me.

T F 5. I am about as able to work as I ever was.

T F 6. I enjoy detective or mystery stories.

T F 7. I do not tire quickly,

T F 8. At times I feel like swearing.

T F 9. I am often sick to my stomach.

T F 10. At times I feel like smashing things.

T F 11. I have had periods of days, weeks, or months when I couldn't take care of things because I couldn't "get going."

T F 12. I am about as nervous as other people.

T F 13. I am in just as good physical health as most of my friends.

T F 14. I am very confident of myself.

T F 15. I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.

T F 16. Most of the time I feel blue.

T F 17. I think I would like the kind of work a forest ranger does.

T F 18. It takes a lot of argument to convince most people of the truth.

T F 19. I don't like to face a difficulty or make an important decision.

T F 20. I do many things which I regret afterwards (I regret things more or more often than others seem to).

T F 21. At times I feel that I am going to crack up.

T F 22. I frequently find it necessary to stand up for what I think is right.

T F 23. Most poeple will use somewhat unfair means to gain profit or an advantage rather than to lose it.

T F 24. I often find myself worrying about something.

T F 25. I like dramatics.

T F 26. I wish I could be as happy as others.

T F 27. Often I can't understand why I have been so cross and grouchy.

T F 28. I do not worry about catching disease.

T F 29. At times my thoughts have raced ahead faster than I could speak them.

T F 30. I am usually calm and not easily upset.

T F 31. Criticism or scolding hurts me terribly.

T F 32. I cry easily.

T F 33. I like to cook.

T F 34. I feel anxious about something or someone almost all of the time.

T F 35. At times I feel like picking a fist fight with someone.

T F 36. I have often lost out on things because I douldn't make up my mind.

T F 37. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.

T F 38. I have never had a fit or convulsion.

T F 39. I blush as often as others.

T F 40. I have had periods in which I carried on activities without knowing later what I had been doing.

T F 41. I have diarrhea ("the runs") once a month or more.

T F 42. I have never felt better in my life than I do now.

T F 43. What others think of me does not bother me.

T F 44. It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing.

T F 45. I worry quite a bit over possible troubles.

T F 46. I find it hard to make talk when I meet new people.

T F 47. I am against giving money to beggars.

T F 48. I like to flirt.

T F 49. I do not notice my heart pounding and I am seldom short of breath.

T F 50. I think I would like the work of a building contractor.

T F 51. My sleep is restless and disturbed.

T F 52. I like science.

T F 53. I get mad easily and then get over it soon.

T F 54. I brood a great deal.

T F 55. I am often afraid that I am going to blush.

T F 56. I have difficulty in starting to do things.

T F 57. I am easily embarrassed.

T F 58. When in a group of people I have trouble thinking of the right things to talk about.

T F 59. My feelings are hurt easier than most people.

T F 60. I do not blame a person for taking advantage of someone who lays himself open to it.

T F 61. At times I am all full of energy.

T F 62. Sometimes I become so excited that I find it hard to get to sleep.

T F 63. I have often felt that strangers were looking at me critically.

T F 64. I have sometimes felt that difficulties were piling up so high that I could not overcome them.

T F 65. I do not often notice my ears ringing or buzzing.

T F 66. Once in a while I feel hate toward members of my family whom I usually love.

T F 67. At times I have been worried beyond reason about something that really did not matter.

T F 68. I do not have as many fears as my friends.

T F 69. I have periods in which I feel unusually cheerful without any special reason.

T F 70. Even when I am with people I feel lonely much of the time.

T F 71. I think nearly anyone would tell a lie to keep out of trouble.

T F 72. My mother or father often made me obey even when I thought that it was unreasonable.

T F 73. I practically never blush.

T F 74. I have nightmares every few nights.

T F 75. I feel anxiety about something or someone almost all the time.

T F 76. I usually have to stop and think before I act even in trifling matters.

T F 77. I feel hungry almost all the time.

T F 78. Often I cross the street in order not to meet someone I see.

T F 79. Often my bowels don't move for several days at a time.

T F 80. I often feel as if things were not real.

T F 81. I have more trouble concentrating than others seem to have.

T F 82. Sometimes some unimportant thought will run through my mind and bother me for days.

T F 83. I have a great deal of stomach trouble.

T F 84. At periods my mind seems to work more slowly than usual.

T F 85. I very seldom have spells of the blues.

T F 86. At times I lose sleep over worry.

T F 87. I wish I could get over worrying about things I have said that may have injured other people's feelings.

T F 88. I often dream about things I don't like to tell other people.

T F 89. People often disappoint me.

T F 90. I feel unable to tell anyone all about myself.

T F 91. My plans have frequently seemed so full of difficulties that I have had to give them up.

T F 92. Often, even though everything is going fine for me, I feel that I don't care about anything.

T F 93. I have often felt that I faced so many difficulties I could not overcome them.

T F 94. I often think, "I wish I were a child again."

T F 95. I have often met people who were supposed to be experts who were no better than I.

T F 96. I am happy most of the time.

T F 97. It makes me feel like a failure when I hear of the success of someone I know well.

T F 98. I have been afraid of things or people that I know could not hurt me.

T F 99. I am apt to take disappointments so keenly that I can't put them out of my mind.

T F 100. I certainly feel useless at times.

T F 101. If given the chance I would make a good leader of people.

T F 102. I find it hard to keep my mind on a task or job.

T F 103. At times I think I am no good at all.

T F 104. I like to attend lectures on serious subjects.

T F 105. I worry quite a bit over possible misfortunes.

T F 106. I worry over money and business.

T F 107. I try to remember good stories to pass them on to other people.

T F 108. I am apt to pass up something I want to do because others feel that I am not going about it in the right way.

T F 109. I am more self-conscious than most people.

T F 110. I was fond of excitement when I was young (or in childhood).

T F 111. I am a very nervous person.

T F 112. I am often inclined to go out of my way to win a point with someone who has opposed me.

T F 113. It makes me nervous to have to wait.

T F 114. I enjoy social gatherings just to be with people.

T F 115. I enjoy the excitement of a crowd.

T F 116. I have very few headaches.

T F 117. My worries seem to disappear when I get into a crowd of lively friends.

T F 118. I work under a great deal of strain.

T F 119. I find it hard to set aside a task that I have undertaken, even for a short time.

T F 120. I have had no difficulty starting or holding my urine.

T F 121. I have several times had a change of heart about my life work.

T F 122. I am often sorry because I am so cross and grouchy.

T F 123. At times I am so restless that I cannot sit in a chair for very long.

T F 124. I am fascinated by fire.

T F 125. I cannot keep my mind on one thing.

T F 126. At times I have been worried beyond reason about something that really did not matter.

T F 127. I like to let people know where I stand on things.

T F 128. I have a daydream life about which I do not tell other people.

T F 129. I sweat very easily even on cool days.

T F 130. Some of my family have quick tempers.

T F 131. I have often felt guilty because I have pretended to feel more sorry about something than I really was.

T F 132. When embarrassed I often break out in a sweat which is very annoying.

T F 133. I would like to wear expensive clothes.

T F 134. I feel tired a good deal of the time.

T F 135. I like repairing a door latch.

T F 136. At times I think I am no good at all.

T F 137. I sometimes feel that I am about to go to pieces.

T F 138. I frequently notice my hand shakes when I try to do something.

T F 139. My hand and feet are usually warm enough.

T F 140. I am the kind of person who takes things hard.

PERSONAL INTERVIEW

INTRODUCTION

This interview is designed to assess women's attitudes toward their role as university students. This is assuming that a woman's experience in the university is somewhat different from that of a man just by reason of her being female. I will ask you a number of questions dealing with this issue. These questions are general enough so that you will have no difficulty finding answers. The questions are intended for discussion and I encourage you to mention anything you feel is relevant. Since we are recording the interview and are only interested in your ideas and comments I will not enter into your discussion. The length of time you spend on each question is entirely up to you and I will introduce the next question when you feel you have said all you want to. Keep the fact in mind that while you are acting as a representative of university women in general I am especially interested in your personal opinions and experiences. Do you have any questions?

IMPERSONAL INTERVIEW

INTRODUCTION

This interview is designed to assess women's attitudes toward their role as university students. This is assuming that a woman's experience in the university is somewhat different from that of a man just by reason of her being female. I will ask a number of questions dealing with this issue. These questions are general enough so that subjects have no difficulty finding answers. The questions are intended for discussion and I am encouraging each subject to mention anything she feels relevant. Since we are recording the interview and are only interested in a subject's ideas and comments I will not enter into the discussion. The length of time a subject spends on each question is entirely up to her and I will introduce the next question when the subject feels she has said all she wants to. Keep the fact in mind that the subject is asked to act as a representative of university women in general and does not have to give personal answers. Are there any questions?

PERSONAL INTERVIEW

ITEMS:

1). Do you feel that you receive less encouragement and direction from your university profs than male students do?

2). Some feel that there are fewer resources available to women in financing a university education than to men. Do you think this is so? How are you financing your university education?

3). Many people feel that women are involved in university work for reasons less than academic or more specifically to get a husband. How do you react to the statement that the only reason you are attending university is to get a husband?

4). Do you feel that you have as many opportunities for leadership in university government and for further academic work available to you as there are to a man?

5). As it turns out many women never finish their university education. What about your university work do you find less than satisfactory and what

IMPERSONAL INTERVIEW

ITEMS:

1). Do women receive less encouragement and direction from their university profs than male students do?

2). Some feel that there are fewer resources available to women in financing a university education than to men. Is this so? How do most women finance their university education?

3). Many people feel that women are involved in university work for reasons less than academic or more specifically to get a husband. How do most women react to the statement that the only reason they are attending university is to get a husband?

4). Are there as many opportunities for leadership in university government and for further academic work available to women as there are to men?

5). As it turns out many women never finish their university education. Why do women find their university work less than satisfactory and even

PERSONAL INTERVIEW	IMPERSONAL INTERVIEW
might even cause you to decide to terminate your university work?	decide to terminate their university work?
6). What are your reasons for deciding to attend university in the first place?	6). What are the reasons women decide to attend university in the first place?
7). What courses do you prefer? What majors (or areas of concentration) are most attractive to you?	7). What courses do women prefer? What majors (or areas of concentration) are most attractive to them?
8). Do you react differently toward female professors than you do toward male professors?	8). Do women university students react differently to female professors than to male professors?
9). Some people (families; parents) feel that a university education is not as necessary for a woman as for a man. How does your family feel about your attending university?	9). Some people (families; parents) feel that a university education is not as necessary for a woman as for a man. How do most families feel about their daughters (or mothers) attending university?
10). You may get married and consequently never use your university work in a professional setting. Of what value would your university education be to you in this situation?	10). Many women get married and consequently never use their university work in a professional setting. Of what value would a university education be to women in this situation?

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