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FINAL REPORT

TITLE: Speech Characteristics As Indices of Attitude, Mood, and Motivational State

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INTRODUCTION

For the past fourteen years the principal investigator and his colleagues have been studying such formal, noncontent, structural dimensions of communicative interaction between interviewer and interviewee as frequency and duration of each participant's single units of speech, silence, and interruptions. Reviews of the research to date are contained in Matarazzo (1965), Matarazzo, Wiens, & Saslow (1965), and Matarazzo, Wiens, Matarazzo, & Saslow (1968). Earlier studies in this program of research indicated that these objective, noncontent dimensions of interviewee speech are both (1) highly reliable for each individual, and (2) are nevertheless subject to control and change by an interviewer. Thus we have shown (see earlier mentioned reviews) that by planned changes in his own speech behavior an interviewer can increase or decrease his conversational partner's (1) average duration of speech (utterance), (2) average duration of reaction time (latency before responding to the interviewer's last comment), and (3) interruption rate.

It appeared to the principal investigator and his colleagues that in order for us to increase our knowledge in this area for basic personality theory and study even further, the results of this more than a decade of research on speech ought to be extended in order to test the potential of these speech measures as indices of underlying attitudinal, mood, and motivational states. That such a move into basic personality theory was tenable was suggested by a study of ours that revealed that an experimentally induced "expectancy" in an interviewee that he would talk to either a "cold" or "warm" interviewer markedly influenced the interviewee's latency before answering the interviewer in an otherwise free employment interview (Allen, Wiens, Weitman, & Saslow, 1965). Likewise, a study by Craig (1966) revealed that the increased accuracy of an interviewer's statements about an interviewee's underlying personality and attitudinal attributes very clearly affected (increased) the length of the subsequent response by the interviewee.

RESEARCH DESIGN

An interviewer (Thomas Manaugh) interviewed individually 80 interviewees, all paid college students. An observer (Arthur N. Wiens) recorded "live" each individual speech and silence activity on the Multiple Interaction Recorder from the other side of a one-way mirror. The 80 Ss contained two control groups and two experimental groups of 20 Ss; each of the latter two groups of whom had been given standardized instructions by a research associate (Janet Kirkpatrick or Marie Boylston) to deceive the interviewer in one part (educational history) of a three-part patterned interview. Each interviewee was asked the same 45 open-ended questions by the same interviewer in the same sequence: 15 each relating to the interviewee's: (1) early and family background; (2) college education; and (3) occupational background and career plans.

The "Lie Instructions" given the two groups of experimental Ss required each of these 40 Ss to ". . . tell the truth in all areas (of the interview) but one. When the interviewer asks you anything about education we want you deliberately to lie, but skillfully so he does not know you are lying. The lie is simple: just tell him you are one year further in school than you are. Can you deceive him so that he will believe you have had one more

year of schooling than you actually have had?" Thus, for example, college freshman were to state they were sophomores and to answer all other questions accordingly, etc.

Since the Education questions came in the middle of our three-period patterned interview, we reasoned that the set to lie, given prior to the beginning of the interview, might be so potent as to influence the presumably neutral but first appearing content area (family and background history). Accordingly we gave our lie (and control) instructions to our four groups at two different points:

	POINT IN TIME			
	1	2	3	4
Group 1	(Lie Instructions)	Family	Education	Occupation
Group 2	(Neutral Instructions)	Family	Education	Occupation
Group 3	Family	(Lie Instructions)	Education	Occupation
Group 4	Family	(Neutral Instructions)	Education	Occupation

This research design permitted the possibility that for Group 1 the externally-induced motivational set to lie to the interviewer would remain dormant during the Period 1 discussion of an instruction-based irrelevant topic (Family Background), and that (as a motivational variable) it would, hopefully, become operative in the second period (Education) of the interview of this group. This "postponed set" is not the case in Group 3, where such Lie set instructions come after the discussion of Family history. (Parenthetically, we believe this issue of postponed versus immediately viable set which is highlighted by the differences in the presumed total motivational state of the individuals in the two groups (1 versus 3 and their two control groups) has implications for research in personality theory more generally and thus is not peculiar to this particular study alone. We had every reason, at the outset twelve months ago, to believe that our two control groups (2 and 4) were just that and that as such they would allow us to make the appropriate within-own-group and across-group comparisons.

RESULTS

Table 1 contains the results from the first group, namely those receiving the Lie instructions before the actual interview began. The results shown under the interviewer's three columns in Table 1 reveal that the interviewer was able to follow the rules he set for himself. Thus his durations of utterance in asking the fifteen questions in each

TABLE 1

EFFECT OF LIE INSTRUCTIONS GIVEN JUST BEFORE INTERVIEW

SPEECH VARIABLE	INTERVIEWER			INTERVIEWEE			SIGNIFICANCE LEVELS			
	Family	Educ	Occup	Family 1	Educ 2	Occup 3	F Value	1 Vs 2	1 Vs 3	2 Vs 3
Duration of Utterance	5.4	5.5	5.5	23.6	29.8	32.5	.01	.05	.05	
Reaction Time Latency	.36	.39	.46	3.06	2.19	3.29	.001	.01		.001

TABLE 2

EFFECT OF NEUTRAL INSTRUCTIONS GIVEN JUST BEFORE INTERVIEW

Duration of Utterance	5.4	5.5	5.6	31.2	39.1	37.4	.07	.05	.05	
Reaction Time Latency	.43	.43	.55	2.84	1.85	2.49	.01	.01		.001

of the three periods were similar and averaged 5.4, 5.5, and 5.5 seconds, respectively. In addition, he carried out his plan to ask all his questions with a reaction time for himself of under one second (specifically, his reaction time latencies with Group 1 were .36, .39, and .46 seconds, respectively). (Inspection of Tables 2, 3, and 4 reveals comparable findings for the interviewer's own speech and silence behavior and we can conclude that his speech "input" was comparable from one period of the interview to the next and from one group to the next.)

Examination of the middle (and right side) of Table 1 reveals that, unlike the speech behavior of the interviewer, the speech behavior of the 20 interviewees in this Lie Instruction group was markedly different across the three periods. Thus, for these 20 Lie group interviewees, the F value across the three periods, was significant at the (a) .01 level for mean duration of interviewee utterance and (b) at the .001 level for mean interviewee reaction time latency. Examination of the directions of these differences across means suggests that the effect of instructions to lie about one's years of completed college was:

> (1) a statistically significant increase (from 23.6 to 29.8 seconds) in the interviewees' average duration of utterance (per response) while discussing the motivational set-relevant topic (Education);
>
> (2) a maintenance of this increase in the (mean) level of speech even when the topic area was changed to occupation (32.5 seconds) and thus presumably was no longer relevant to the lie instructions;
>
> (3) a decrease (quickening), from 3.06 seconds to 2.19 seconds, in the interviewee's average reaction time, or latency, when he was talking about the topic in which he had been instructed to lie; and
>
> (4) a return (3.29 seconds) to the slower pace (longer reaction time) when this topic area (Education) was discontinued and a less instruction-relevant topic area (Occupation) was introduced.

That the four sets of interrelated results just presented are not merely statistical artifacts can be seen visually in Figures we constructed (but not included in this report) of the means for these two speech variables for (a) each of the interviewees in Group 1 (who were given the prior lie instructions) and also for (b) the interviewer interviewing each of them. The figure for Group I shows the interviewees' shift to the right in Period 2 (an increase in average duration of utterance), and the maintenance of this average group shift in Period 3.

Had our study research design included only Group 1, and had it not included the three additional groups shown in Tables 2, 3, and 4, we might have been led to a premature set of conclusions. That is, reasoning from our earlier content study (1963) which showed no differences in interviewee speech behavior across these same three content areas,

we might have been tempted to conclude from Table 1 (and our Figures) that our guess that our speech measures would be sensitive to deception (as well as other motivational states) would appear to have been borne out.

Alas, and fortunately for researcher's morale and long-range commitments, our adversary and nemesis (total initial ignorance by us in this new area) would not have it so. That is, inspection of Table 2 reveals results with a presumed neutral control group which are, for all practical purposes, identical to those with our Lie group shown in Table 1.

We were, at first, very surprised by this behavior of our Neutral Group. Our 1963 study, utilizing police patrolman job applicants from roughly the same age group as the college students shown in Table 2, and utilizing the same three content topics (Family, Education, and Occupation), yielded means (41.4, 35.0, and 40.7 respectively, p not significant) for these three topic areas that were not statistically significant one from the other. Yet our 20 college student interviewees, constituting what we believed was a viable control group, behaved much as did our Lie group and very differently from this 1963 "control" group of job applicants.

Our immediate interpretation of the finding shown in Table 2 (and the Figures showing the individual scores) is that we may have accidentally stumbled upon the operation of a potent but self-imposed motivational-attitudinal set which is most clearly revealed in this second group of 20 college students. That is, since they (and the 20 Ss in the Lie group) were actually recruited from the classrooms of a local college (Portland State College), and thus presumably may be more actively involved in and preoccupied with affairs and activities revolving around their college education (our critical topic area), any interviewer-initiated discussion of this topic, whether with interviewees in the so-called lie or neutral groups, would tap a highly viable or potent motivational complex extraneous to the initial expectations and interests of our research group (but now of considerable interest if we can confirm this lead). Whereas we have in Tables 1 and 2 merely a beginning inkling that some content topics, because of the interviewees' own peculiar current life affairs and interests, may be more salient in the sense of standing out from the rest of his motivational traits, this inkling (unexpected finding) appears well worth further study in our research program.

The reader may not be surprised at this apparent finding since, after all, it is consistent with expectations which form the basis of much of the research in such areas as basic personality theory, motivation, psychophysiology, projective testing, etc. However, it is of interest to us because, in conjunction with our earlier experimentally introduced "warm-cold set" study, it provides the first bit of additional evidence that our speech and silence measures may turn out to be efficient indices of such important, but heretofore almost impossible-to-measure, endogenously-produced or exogenously-induced motivational states.

Some years ago Kanfer (1959) found that a group of 20 male and female college students did not show any group differences in his speech measure (word rate) as they each discussed five different content topics (their Family, Self-Confidence, Achievement, Sex, and Emotional Maturity) in a short experimental interview with a single interviewer. Nevertheless, despite the lack of group differences, it did appear that some of Kanfer's individual Ss were differentially affected by one or another of these topics (especially Sex and Family Relationships). Additionally, in a second study, Kanfer (1960), employing 36 female psychiatric

inpatients, found what we can describe as a similar example of topic saliency affecting a speech index. In this study he employed four content areas (Present Home, Family, Sexual Attitudes, and Present Illness) and found that these patients spoke 120 words per minute when discussing the presumed most salient content area (their Present Illness), and only 90 words per minute (25 per cent slower) when discussing the other topic areas. The findings from Kanfer's two studies, although using a speech measure which differs from our own, do add additional support to the preliminary conclusions regarding the possibility of "education-saliency" as an additional motivational state operating in our Neutral (and Lie) groups described above.

The reader will remember that our research design included a methodology to test the best point at which to introduce the experimenter-imposed (and endogenous) lie set in the interviewee. Groups 3 and 4 received their Lie and Neutral instructions just at the point at which the education area was to be introduced.

Table 3 contains the results for this second Lie Group. Once again the results reveal (1) the statistically significant increase (from 29.1 to 35.7 seconds) in mean duration of utterance during discussion of the critical content area (Education); (2) the maintenance (38.1 seconds) in Period 3 of this increase from the initial base level; and (3) a corresponding decrease (from 2.26 to 2.03 seconds) in reaction time latency and recovery (3.26 seconds) in the third period.

The results in Table 3 are a clear cross-validation of those in Table 1 and suggest that the point at which the instructional set to deceive was introduced in this study was not a relevant variable.

However, the finding that the topic of education was an over-riding salient variable in these college student interviewees (as suggested by the findings in Table 2) also was crossvalidated as is shown in Table 4. In this second, previously believed "Neutral" group, the 20 interviewees once again (1) significantly increased (from 20.8 to 28.4 seconds) their speech output per utterance when discussing education; (2) maintained, and even increased this level further (34.9 seconds) in Period 3; and, (3) again decreased (from 2.34 to 2.10 seconds) their reaction time latencies as they went from the presumed less-salient topic of family and early background to the more immediately relevant and encompassing (salient) topic of education, only once again, to decrease (2.64) their reaction time to its slower base period level in period 3. The findings in Table 4 are a full cross-validation of those given for the Neutral Group shown in Table 2.

It appears to us that the crossvalidated results from all four groups (both lie and neutral groups) strongly suggest that, for these 80 college student interviewees, discussion of an educationally-relevant topic area appeared to tap a motivational system demonstrably different from the motivational system tapped by a similar discussion of family and occupation background (two areas believed by us to be less relevant, and thus less salient, to these full-time college students).

These findings from the first year of our research program appear to offer some confirmation for our initial decision and expectation that our speech measures might serve as useful indices of underlying motivational and attitudinal states, and thus they may

TABLE 3

EFFECT OF LIE INSTRUCTIONS GIVEN IN MIDDLE OF INTERVIEW

SPEECH VARIABLE	INTERVIEWER			INTERVIEWEE			SIGNIFICANCE LEVELS			
	Family	Educ	Occup	Family 1	Educ 2	Occup 3	F Value	1 Vs 2	1 Vs 3	2 Vs 3
Duration of Utterance	5.4	5.4	5.5	29.1	35.7	38.1	.05		.01	
Reaction Time Latency	.34	.44	.52	2.26	2.03	3.26	.001		.01	.001

TABLE 4

EFFECT OF NEUTRAL INSTRUCTIONS GIVEN IN MIDDLE OF INTERVIEW

SPEECH VARIABLE	INTERVIEWER			INTERVIEWEE			SIGNIFICANCE LEVELS			
	Family	Educ	Occup	Family 1	Educ 2	Occup 3	F Value	1 Vs 2	1 Vs 3	2 Vs 3
Duration of Utterance	5.6	6.0	5.9	20.8	28.4	34.9	.001	.001	.001	.01
Reaction Time Latency	.38	.55	.62	2.34	2.10	2.64	.05			.01

provide another viable approach to the study of basic personality functioning. Other studies suggested by these findings of the first year are now being conducted and it is hoped will capitalize on the unexpected but welcome finding of topic-saliency ("education" in college Ss) in speech behavior.

No publications have resulted from the work of this first year. A new version of the Multiple Interaction Recorder was designed and constructed however.

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13. ABSTRACT

The results of fourteen years of prior research suggested that such objective speech measures as frequency and duration of interviewee (1) utterance, and (2) reaction time latency had considerable potential as indices of underlying attitudinal, mood, and motivational state and thus could further our study of personality functioning. The research design utilized 40 Ss instructed to lie to the interviewer in one period (years of education completed) of a three-period interview and 40 control Ss who were not instructed to lie. The results revealed the surprising finding that both the speech and silence measures were highly sensitive to one content topic (Education) in all 80 of these college student Ss, relative to the two other content topics (Family, and Occupational Background). Thus the fact they were all educationally involved college students (both control and experimental Ss) appeared to be such a potent and salient factor that (equal with the findings in the experimental group) this salient factor revealed itself even in the control group by showing itself in (1) a significantly shorter reaction time and (2) a significantly longer average duration of utterance. Studies being conducted and planned for future years will capitalize on this unexpected but welcome finding of topic-saliency ("education" in college Ss) in speech behavior.

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