A STUDY OF INDIVIDUAL DIFFERENCES AND OF INTERACTION IN THE BEHAVIOUR OF SOME ASPECTS OF LANGUAGE IN INTERVIEWS.

By F. GOLDMAN-EISLER, Ph.D.,

Medical Research Council Unit for Research in Occupational Adaptation, Maudsley Hospital.

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I. INTRODUCTION.

SINCE the interviewing process, or the process of two people talking to each other is an extremely complex phenomenon, it seemed advisable to begin its analysis at the elementary and quantitative level, by first of all measuring the duration both of periods of continuous speech, and of the pauses and then after investigating their various relations and rhythmic alternation, to work up through grammatical analysis to the more complex phenomena.

II. EXPERIMENT.

An experiment was staged in which three senior psychiatrists of Maudsley Hospital (who will be referred to as D1, D2, and D3), took part. They were chosen on the basis of a judged difference in their conversational activity, the experimenter predicting essentially different scores for D1 on the one hand

and D2 and D3 on the other. A group of patients, five reserved (four cases of depression and one of uncertain diagnosis), and five talkative (four cases of anxiety and one uncertain), were then selected to be interviewed by all the three doctors in rotation. There were thus 30 interviews altogether. Any errors arising from the order of interviewing, that is, from the fact that patients would respond differently according to whether they were interviewed for the first, second, or third time, irrespective of which doctor interviewed them, were controlled by putting them in random order.

The three interviewers were thus compared against a constant stimulus background. Furthermore, in order to make the interviews comparable a common aim was set, namely to describe and diagnose the patients' present mental state. The doctors were, within those limits, given freedom to use their own personal technique and approach.

These interviews were recorded both on the interaction chronograph, giving a continuous record of the length of time taken up in action (speech and relevant gesture) and silence by each of the speakers, and also on the speech recorder.

III. Previous Results.

The following results, reported elsewhere in detail (4), emerged from the analysis of the time recording (interaction chronograph).

1. Interviewers showed themselves to behave consistently, irrespective of the type of patient interviewed, with respect to two of the three measures taken: (*a*) bs/ds, i.e., the ratio of the total number of short silences (bs) to the total number of long silences (ds) in the speech of the interviewer, and (*b*) A + S, i.e., the average period comprising an action (A) plus its subsequent silence period (S). As regards the third measure used, namely AT, i.e., the total amount of time that was spent in action (talk and gesture) expressed as a percentage of the total time of the interview, the interviewers showed themselves consistent in relation to each other, but all adjusted themselves to about the same extent when passing from the reticent group of patients to the talkative.

The patients' conversational behaviour was consistent with respect to bs/ds, and AT. While the latter value, i.e., the amount of time spent in talking, proved independent of the interviewers, the bs/ds score (activity rate) showed itself sensitive according as one or the other doctor was the interviewer. A + S (conversational tempo) did not show reliability but seemed subject to interviewers' influence.

In short, the interviewers showed themselves more rigid with respect to activity rate (bs/ds) and tempo or rhythm of interaction while being highly flexible with respect to the amount of time they talked in an interview. Patients were most rigid with respect to the amount of time and activity, and seemed subject to influence in respect of tempo or rhythm of interaction.

IV. Grammatical Analysis.

The following results emerged from the analysis of the data obtained from the speech recorder. The records were transcribed to manuscript form and a count was then taken of all the words used by each of the speakers for the

following grammatical categories: nouns, verbs, adjectives, and self-reference terms.

For each speaker, calculations were made of the average number of words spoken per minute (the "word rate"), and of the proportion of words in each of the selected grammatical categories to the total number of words uttered.

Unfortunately some of the speech recordings were fragmentary. In particular the subdued tones of the depressed patients presented the microphone with too difficult a task. Consequently only twenty-five complete records became available in the case of the patients. Among the doctors, eight of these recordings involved D1 as interlocutor, seven D2, and ten D3.

The question was then asked whether any of these facets of language behaviour could be shown to be consistent for individuals. For the doctors there were ten or at least seven to eight sets of figures available for each category, each doctor having conducted ten interviews. For the patients only three sets of figures were available each having been interviewed three times.* These figures are averages based on each interview as a whole summarizing language behaviour during stretches containing an average of about 2,300 words apiece.

An analysis of variance was computed for each of the above quoted grammatical categories, and also for the verb/adjective and noun/self-reference ratios, and the word rate, separately for doctors and patients.

1. *General Results.*

Tables I and II present an overall picture resulting from the analyses of the variance of the various categories of the language used in the interviews which are enumerated above.

Table I shows that, as far as the doctors are concerned, the word rate (number of words a minute), the percentage of self-reference terms, and the

TABLE I.—*Doctors.*

		Means.	S.E.	F-ratio.	P.	
Number of words per minute	D1	198·2	7·81	..	..	
	D2	168·1	4·28	10·6	·001	
	D3	222·7	9·73	..	..	
Self-reference terms, per cent.	D1	1·80	0·32	22·2	..	
	D2	1·66	0·21	..	·001	(F = 9·6)
	D3	3·93	0·28	..	..	
Nouns	D1	12·79	0·21	4·89	..	
	D2	10·60	0·54	4·89	·05	(F = 3·4)
	D3	11·18	0·60	..	·01	(F = 5·7)
Nouns/Self-reference terms ratio	D1	8·19	0·94	..	..	
	D2	7·36	1·43	10·8	·001	
	D3	2·98	0·30	..	..	
Adjectives	D1	8·27	0·67	..	..	
	D2	10·05	0·61	3·4	·05	
	D3	8·48	0·26	..	..	
Verb/Adjective ratio	D1	3·05	0·29	5·6	·01	
	D2	2·13	0·22	..	·01	
	D3	2·49	0·08	..	..	

* Complete records of three interviews each were available only for five patients.

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TABLE II.—*Patients.*

		Means.	F-ratio (comparing interviews with D1, D2, D3).	P.	F-ratio (comparing interviews with D1 and D2 only).	P.	
Number of words per minute	P4	167·2	..	..	..	..	
	P6	187·5	..	..	..	..	
	P7	192·9	1·7	N.S.	69·5	·001	(F = 3·1)
	P8	214·1	..	..	..	..	
	P9	192·2	..	..	..	..	
Self-reference terms	P4	12·32	..	..	..	..	
	P6	11·10	..	..	..	..	
	P7	9·54	2·6	N.S.	76·1	·001	(F = 53·4)
	P8	10·14	..	..	..	..	
	P9	10·14	..	..	..	..	
Nouns	P4	14·16	..	..	..	..	
	P6	11·37	..	..	..	..	
	P7	14·41	1·36	N.S.	..	..	
	P8	11·40	..	..	..	..	
	P9	13·44	..	..	..	..	
Noun/Self-reference ratio	P4	1·15	..	..	..	..	
	P6	1·04	..	..	..	..	
	P7	1·61	1·67	N.S.	..	..	
	P8	1·13	..	..	..	..	
	P9	1·33	..	..	..	..	
Adjectives	P4	9·57	..	..	..	..	
	P6	9·99	..	..	..	..	
	P7	11·98	2·24	N.S.	..	..	
	P8	10·95	..	..	..	..	
	P9	12·06	..	..	..	..	
Verb/adjective ratio	P4	2·40	..	..	..	..	
	P6	2·06	..	..	..	..	
	P7	1·49	4·19	·05	(F = 3·8)	..	
	P8	1·78	..	..	..	..	
	P9	1·46	..	..	..	..	

ratio of nouns to self-reference terms, have all proved highly reliable categories of language, discriminating between the three doctors significantly with a probability of ·001.

The verb-adjective ratio, the percentages of nouns and of adjectives are also consistent with a lower reliability (P = ·05), the verb-adjective ratio being the most constant among these measures.

As to the patients, whose tests are summarized in Table II, only the verb/adjective ratio discriminates significantly (P = ·05) between the individual patients when the scores from their interviews with all three doctors are compared. On inspection of the figures, however, it can be seen that for the word rate (number of words a minute) (see Table III) and the self-reference percentages (see Table IV) there was little variation in the scores obtained from the interviews with D1, and D2, but that in the interviews with D3 their values shifted considerably. These shifts, however, did not occur consistently in one direction, D3 apparently having a different effect upon each patient. But they had this in common, that they were rather spectacular in comparison

TABLE III.—*Number of Words per minute for each Patient P4, P6, P7, P8, P9 given for each Interview.*

Doctor Interviewing.	P4.	P6.	P7.	P8.	P9.
1	157·4	184·1	175·5	217·6	193·5
2	177·4	183·7	170·7	215·1	188·5
3	166·7	194·6	232·5	209·6	194·7
Mean	167·2	187·5	192·9	214·1	192·2
S.D.	7·5	3·6	32·5	3·3	4·5

TABLE IV.—*Percentages of Self-reference Terms for Patients P4, P6, P7, P8, P9 given for each Interview.*

Doctor Interviewing.	P4.	P6.	P7.	P8.	P9.
1	11·99	11·12	10·78	9·29	9·23
2	12·29	11·71	10·82	9·99	9·56
3	12·69	10·46	7·02	11·14	11·62
Mean	12·32	11·10	9·54	10·14	10·14
S.D.	0·41	0·43	1·78	0·76	1·03

with the consistency of word rate and self-reference percentage maintained by the patients when talking to D1 and D2. Indeed, the consistency of word rate and self-reference terms, when based on the interviews with D1 and D2, proved to be very high, the correlations being 0·984 ($P = \cdot001$) and 0·986 ($P = \cdot001$). In conjunction with the fact that word rate and self-reference percentage had also been shown to be relatively invariant characteristics of the doctors' speech, it seems reasonable to assume that a considerable degree of constancy attaches to these two categories in the language of individuals generally*. The interviews with D3 seem, however, to have involved stimulation different in kind from that at work in the interviews with D1 and D2, with an ensuing different level of adaptation in these linguistic modes of behaviour.

To throw more light upon this phenomenon a further analysis was undertaken.

2. *Individual Differences between Interviewers and their Effect on the Patients' Responses.*

On examining the figures in the various categories for the doctors we can see that D3 had by far the highest rate of word output (222·7 words a minute as against 198·2 for D1, and 168·1 for D2) (See Table V), and the highest proportion of self-reference terms (3·93 as against 1·80 for D1, and 1·66 for D2) (see Table VI). It will be recalled that with respect to the time measurements reported previously (4), D3 proved to be the interviewer with the highest rate

* However there was a difference in the scope of their constant behaviour as a comparison of the readings for word rate and self-reference percentage in Tables I and II will show. Word rate discriminates between individuals, but it is unaffected by their rôle in the interview, i.e., whether they are doctor or patient. The self-reference percentages, on the other hand, are quite different for the two groups, the patients' frequency of referring to themselves ranging about a mean of 10·7 per hundred words and the doctors' about 2·5. This difference is obviously related to the type of material produced by patients whose rôle it is to talk about themsleves. Word rate shows no such dependence and wide shifts in this form of linguistic action might possibly be manifestations of reactions at a deeper level.

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TABLE V.—*Number of Words per minute for D1, D2, D3 given for each Interview.*

Patients interviewed.	Total number of words. D1.	D2.	D3.
P1	..	..	223·0
P2	..	..	224·6
P3	202·3	180·7	237·1
P4	180·0	145·5	241·2
P5	237·1	—	262·3
P6	203·2	170·3	237·2
P7	214·5	167·6	236·4
P8	164·7	176·4	148·5
P9	198·8	160·0	211·6
P10	184·9	175·9	205·3
Mean	198·2	168·1	222·7
S.E.	7·81	4·28	9·73

TABLE VI.—*Percentages of Self-reference Terms for D1, D2, D3 given for each Interview.*

Patients. interviewed.	D1.	D2.	D3.
1	..	..	3·00
2	..	..	3·37
3	1·55	1·68	3·44
4	1·79	1·65	5·77
5	1·40	..	4·07
6	1·81	1·64	3·72
7	3·99	2·54	3·23
8	1·07	1·41	5·05
9	1·18	1·82	3·48
10	1·58	1·89	4·22
Mean	1·80	1·66	3·93
S.E.	0·32	0·21	0·28

of activity as measured by the ratio of short to long silences (bs/ds), and the fastest rhythm or tempo of interaction as measured by the average duration of each spell of activity and its subsequent period of silence (A + S).

On examining the individual figures for the patients' rate of word production and their proportion of self-references (it is in these two categories that D3 differs most strikingly from the other psychiatrists) it will be seen that P6, P7, and P8 were the ones whose interaction with D3 produced the most strikingly different values when the latter are compared with those obtained from their interaction with both D1 and D2. In the case of P6, and even more so in that of P7, this difference was very marked in the direction of speeding up their word production rate and reducing the number of self-references, whereas P8 on the contrary, spoke more slowly, and referred to the self more frequently when interviewed by D3 instead of by one of the other two psychiatrists. P7 offers the most extreme example, and a detailed study was undertaken of the deviation of this patient's language from that displayed in the course of being interviewed by D1 and D2. His behaviour was contrasted with that of P8 by assembling the essential information on these cases as far as it had emerged from this experiment. This analysis should lead to a better understanding

of the background of interaction between P7 and D3, against which these changes occurred.

3. *The Interrelation of some Categories of Language Behaviour and their Psychological Significance.*

Considering the wide concurrent changes in word rate and self-reference percentage, the possibility of a functional relationship between these two measures demanded attention.

Estimating a mean level of word rate and of self-reference percentages on the basis of the patients' interviews with D1 and D2 (which would, of course, only be appertaining to interviewing situations having a comparable stimulation level), the relative positions of their deviations from it, in the interview with D3 were plotted, and it can be seen from Diagram I that for the five patients whose measures we have used in the analysis of variance a negative and possibly linear relationship seems suggested. In other words, a reduction of self-reference terms under the influence of D3 seemed to be accompanied by a speed-up in word production.

A further relationship suggested itself when it was noted that in the case of P7 there was not only a radical rise in word rate when talking to D3, and a concurrent drop in the self-reference percentage, but also a reduction in the total amount of speaking time, the proportions to the total interviewing time being 88 per cent. when talking to D1, 71 per cent. to D2, and 61 per cent. to D3. Plotting the deviations of the patients' total speaking time (AT) in the interview with D3 from their mean AT against their deviations of word rate from their mean word rate with D1 and D2, we again obtain what appears to be a negative linear relation (we would of course need more data to fit a regression line). In other words, a reduction in the amount of speaking time was in these cases accompanied by an increase in the word rate (number of words a minute or speed of talking). (Later observations (5) amply corroborate this relationship).

The relation of the AT percentage and of self-reference terms for the five patients in question was also plotted and Diagram I shows that (as would follow from the above) the correlation is positive.

Thus there is apparently a three-way relationship between these categories of language behaviour; the percentage of self-references which these patients used in their interviews, the relative amount of total time taken up by the interviews during which they talked, and the rate at which they uttered words. While the proportion of self-references and of the amount of speech during the interviews changed in the same direction, the one increasing concurrently with the other, the word rate changed inversely, speeding up the less the patient spoke, and also the less he spoke about himself.

How much a patient actually does talk about himself is—at least partly—a function of the doctor's questioning. The decrease in the total amount of the talking time and increase in word rate or speed of talking would seem, on the other hand, to be aspects of adjustment to the interviewing situation. To return to the most extreme example of this, namely P7, it may be well to note

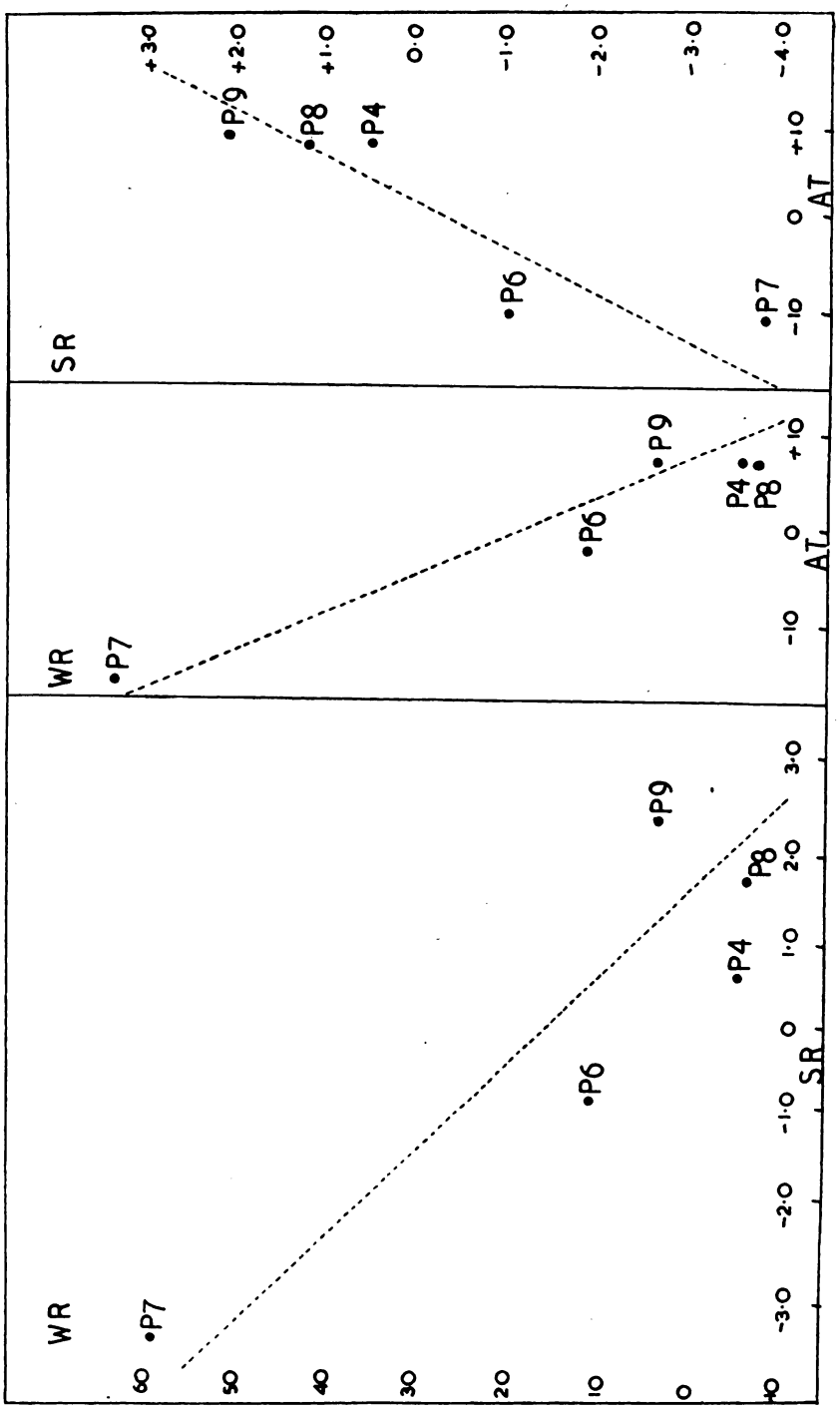

DIAGRAM I.—Shifts of word rate and self-reference terms due to influence of D_3 on P_4, P_6, P_7, P_8, P_9. Shifts of word rate and action time. Shifts of self-reference terms and action time.

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that in his interview with D3, his conversation also included a considerably longer period of mutual silence than his interviews with either D1 or D2. He sometimes failed to respond, while at other times he responded hurriedly as if under pressure. In the case of P8, we have the reverse picture, namely a higher than usual self-reference proportion, with a rise in the total amount of speaking time, and a slowing down in the word rate. That is, the patient talks in this interview more about himself than in the interviews with the other two doctors; he seems under no pressure of acute time consciousness, and acts like somebody who has plenty of time to spare and can therefore afford to slow down. Acceleration in speech rate as intertwined in these two cases may thus turn out to indicate that the speaker feels under some kind of pressure, external or internal.

Corroboration for this interpretation was sought (*a*) by means of analysis of the content and (*b*) by contrasting both the changes in the language behaviour of D3 in the two cases of P7 and P8, and also the changes in the language behaviour of these patients themselves.

V. Content Analysis.

1. *Topic Analysis.*

These interviews having the purpose of coming to a diagnostic assessment had (with all the individual differences among the doctors) this in common, namely that the interviewer focused the attention of the patient on the subject about which he sought information. There were, of course, variations in the degree of initiative taken by the interviewer, but by and large the topics discussed were determined by the kind of questions put by the doctor. Table VII shows the percentage of the total number of words in each interview devoted to the various topics for each doctor and for each of the patients whose manuscripts in all three interviews were complete, i.e., P4, P6, P7, P8 and P9.

Table VII.—*Word Output expended by Patients P4, P6, P7, P8, P9 on Topics raised in Interviews with D1, D2, D3 expressed as Percentages on Total Number of Words used by the Patients.*

Topics.	Patient.	Doctors. D1.	D2.	D3.
1. History of illness, mental state, early history etc.	P4	67·2	41·4	4·7
	P6	70·3	93·2	73·2
	P7	38·0	59·4	19·2
	P8	48·2	61·9	80·2
	P9	61·3	53·7	44·2
2. Family, domestic life	P4	..	1·5	7·8
	P6	..	1·5	..
	P7	..	..	7·1
	P8	1·6	..	..
	P9	..	5·0	..
3. Parents	P4	..	..	..
	P6	..	..	..
	P7	..	..	..
	P8	22·0	16·9	..
	P9	..	..	..

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TABLE VII—*cont.*

Topics.	Patient.	Doctors. D1.	D2.	D3.
4. Women, relationship with spouse	P4	..	17·5	..
	P6	..	..	..
	P7	..	..	..
	P8	7·9	7·5	..
	P9	..	1·4	..
5. Work	P4	..	..	..
	P6	..	..	..
	P7	19·2	6·9	23·0
	P8	10·1	10·3	10·0
	P9	..	10·4	6·8
6. Interests, outside activities	P4	..	..	8·2
	P6	18·6	..	..
	P7	11·0	..	8·4
	P8	2·7	1·8	..
	P9	7·0	8·9	21·4
7. Incidents, objective conditions, people, hospital	P4	..	..	..
	P6	8·9	..	22·6
	P7	6·3	8·7	..
	P8	..	..	..
	P9	7·6	..	..
8. Physical state, medical history	P4	7·9	..	4·4
	P6	..	..	..
	P7	7·1	..	..
	P8	..	..	..
	P9	7·3	..	19·6
9. Treatment	P4	..	3·7	29·4
	P6	..	..	..
	P7	5·8	..	..
	P8	..	..	..
	P9	..	20·0	..
10. Information	P4	..	..	4·3
	P6	..	..	..
	P7	3·3	..	12·2
	P8	..	..	..
	P9	..	..	..
11. Orientation	P4	22·8	..	..
	P6	..	..	..
	P7	..	..	..
	P8	..	..	..
	P9	..	..	..
12. Rapport	P4	1·9	1·6	..
	P6	2·7	0·4	1·1
	P7	1·1	0·8	8·2
	P8	0·4	0·2	0·2
	P9	0·7	0·9	1·9
13. Conclusion	P4	..	0·1	2·8
	P6	0·5	..	..
	P7	1·6	0·2	..
	P8	1·1	..	4·0
	P9	..	0·7	..
14. Miscellaneous	P4	..	..	..
	P6	..	..	..
	P7	1·7	..	..
	P8	4·0	..	5·0
	P9	..	..	..

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From Table VII it can be seen that in all cases but two the bulk of the conversation centres on the subject of mental illness and condition of the patient. Here again the interviews with D3 show a different picture from those with D1 and D2. When interviewed by D3, less than one-quarter of all the words spoken by either P4 or P7 were concerned with this subject (19·2 per cent. and 4·7 per cent.), while when interviewed by D1 and D2, 67·2 per cent. and 41·4 per cent. respectively of all words uttered by P4 were on this subject. In the case of P7's interviews with D1 and D2 the corresponding percentages were 38·0 per cent. and 59·4 per cent. respectively. From this it appears that D1 and D2 were pursuing the standard routine procedure, while D3 seemed to have varied his procedure with the individual patient.

It is particularly interesting to note the wide discrepancy in the word output concerning the subject of mental state in the interviews which D3 conducted, and especially the wide discrepancy between P7 and P8, bearing in mind that in their language behaviour with D3 other discrepancies have already been noted. It can be seen from Table VII that only 19·2 per cent. of words spoken by P7 were about his mental illness and condition, whereas 80·2 per cent. of P8's total word output referred to the subject.

VI. The Analysis of Individual Discrepancies.

1. *P7 and P8 interviewed by D3.*

If we set out the divergencies from their means in the speech behaviour of these two patients side by side with D3's deviations from his own mean when interviewing them, the mean of D3 being based on interviews with ten different patients, the situation may be clarified still further.

Studying Table VIII and its figures (and Diagram II), we are immediately struck by the fact that on most of the language and time measures P7 as compared with P8 shows a diametrically opposite reaction to D3.

It is essential to interpret the variations in the individual categories in concurrence with each other, in order to try and form a picture as to what actually happened in these two interviews and how the doctor's behaviour may have interacted with that of the patient's.

From Table VIII (patients) we see that P7 talked in total amount of time (AT) less and P8 more than their average amount of talking time based on all three interviews. Both patients' rhythm was quickened when talking to D3, i.e., their average duration of silent periods (AvS) as well as action periods (AvA) being shorter than when talking to D2 and D1, thus resulting in a shorter period of A + S (which we provisionally called tempo (4)—though it might probably be more correct to call it rhythm). However, the extent of reduction differs widely and characteristically from P7 to P8. P7 was reduced in his activity to a far greater extent than in his silence while P8 had much shorter periods of silence.

This state of affairs manifests itself most significantly in the amount of double silence (DS), that is the periods in which neither the patient nor the doctor said anything. There was in the interview P7–D3 more than twice as much mutual silence than the mean of the double silence period would make

TABLE VIII.—*Deviations from Means of Time and Language Measurements obtained from Interview Records of P7 and P8 with D3.*

(To make the figures comparable the original quantities were transformed into percentages over means.)

	P7.	P8.	D3–P7.	D3–P8.
AT	−16·4	+9·1	−21·7	−17·4
AvS	−11·0	−52·0	+21·0	−31·0
AvA	−62·0	−18·0	−94·0	−60·0
A+S	−55·0	−5·7	+3·0	−40·0
bs/ds	+6·0	+151·6	−9·5	+73·8
DS	+250·0	−160·0	+200·0	−143·0
FAP/FAD or FAD/FAP	+29·5	−28·9	−54·3	+74·8
KP/D or KD/P	−37·9	+23·1	+75·0	−67·0
WR	+30·3	−3·1	+6·1	−33·3
SR	−35·0	+15·5	−17·8	+28·5
N/S	+39·8	−4·4	+35·5	−38·5
V/A	−12·7	+7·8	−10·8	+11·6
Patients word output on subject of illness and mental state	−50·6	+29·1	..	..

AT = Total action* time in proportion to total duration of interview.
AvS = Average duration of silence periods.
AvA = Average duration of action periods.
A+S = Average duration interaction periods (action + subsequent silence).
DS = Total time of mutual silences in proportion to total duration of interview.
FAP/FAD or FAD/FAP = Relative frequency of action of patient and doctor.
K = Index of dominance (see page 189).
WR = Word rate (= number of words per minute of action).
SR = Percentage in total number of words of self-references.
N = ,, ,, ,, ,, of nouns.
N/S = Ratio of nouns over self-references.
V/A = Ratio of verbs over adjectives.

* The term action stands for speech and communicative gesture.

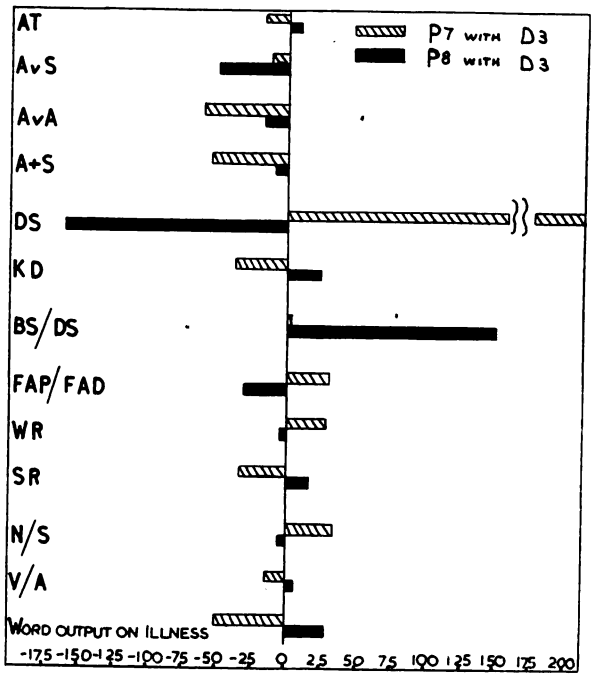

DIAGRAM II.—Deviations from mean expressed as percentages of mean P7 and P8 with D3.

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one expect,* while in the interview P8–D3, DS was one and a half times less. Comparing the relative frequency of actions (and silence) of the patient in relation to the doctor, measured by a quotient whose numerator is the frequency of the patient's actions and whose denominator is the frequency of the doctor's actions (FAP/FAD) it can be seen that P7 started actions more frequently with D3 than with D1 or D2, and P8 started actions less frequently by about the same amount as P7. Summarizing the data so far, P7 in his interview with D3, talked less altogether, but talked more frequently than he did with either D1 or D2. Whereas P8 talked more altogether with D3 than with either of the other two doctors, but less frequently than might have been expected. At the same time P7 had periods in which he did not answer a question put by the doctor (double silence).

In trying to reconstruct this situation it may be visualized in this way: if a conversant starts speaking more often than his interlocutor but does not persist in it, it means that these periods are either of the conventionally brief kind, registering assent, and uttered intermittently during periods of speech activity on the part of the interlocutor (e.g., "yes," "I see," or nods), or they may be attempts to say something which fails to cut through the interlocutor's stream of talk. In both cases the relative number of periods of speech activity would be larger and their relative duration shorter than those of the interlocutor. In both cases too it would mean that the conversant was not dominant in interaction (that he was getting behind in the conversational round of exchanges), either freely assenting to this state of affairs, or else attempting to break through it, but without success. This situation is summarized in an index which we name K, and which is a product of two ratios: (*a*) of the total duration of the actions of speaker X to that of speaker Y, and (*b*) the ratio of the frequency of the actions of Y to the frequency of the actions of X. If, for want of a better term, we provisionally call this index a Dominance score,† it would, in the above form $\left(\frac{ATx}{ATy} \times \frac{FAy}{FAx}\right)$, be the measure of the dominance of speaker X. It yields the highest value in the case of the person who talks the longest and the least often (i.e., talks most of the time without stopping), and the lowest value in the case of the person who takes up the least amount of interviewing time but begins to talk or interjects most frequently. From Table VIII it is evident that in P7's interview with D3, K was considerably above and in P8's interview with D3 considerably below their respective average K indices. (In terms of the interpretation of this reading it would mean that P7 was far more submissive and P8 more dominant in speech behaviour with D3 than the behaviour of these patients in the interviews with D1 and D2 would lead one to expect).

* In raw figures this means that while in the interview P7–D1, DS was − 3 per cent. (i.e., 3 per cent. of the total time of interviewing were simultaneous talk, as is signified by the negative DS score), and in the interview P7–D2, DS was 0 per cent., in the interview P7–D3 the period of mutual silence (S) took up 21 per cent. of the total time of the interview. In the case of P8, DS was 7 per cent. in his interview with D1, 11 per cent. of the total interviewing time with D2, and − 3 per cent. with D3, i.e., during 3 per cent of the interviewing time P8 and D3 talked together.

† Seven subjects of a previous experiment (6) had been ranked for dominance by three judges whose average agreement was ·76. Their mean rank order correlated with the index $\left(\frac{ATx}{ATy} \times \frac{FAy}{FAx}\right)$ ·94 (rank order r).

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This situation is also reflected in terms of word output and word usage: P7 increased the speed of his word production considerably, P8 (slowed it down somewhat, P7 used far fewer self-references, P8 more self-references). The noun/self-reference quotient is higher for P7 with D3 than with D1 and D2, but lower for P8. The verb/adjective ratio is reduced for P7, increased for P8. The reduced verb/adjective ratio indicates, as a number of workers were able to show (1, 2, 3), the saturation of speech with action, emotion, and tension elements versus reflection or description and qualification. In other words the conversation of P7 contained relatively more words of description and qualification than of action and emotional tension, and that of P8 showed the opposite characteristics.

Our last datum is the proportion of words uttered on the various topics, particularly on the mental state, state of emotions and discussion of the patient's illness. P7 spoke far less with D3 about these subjects than his output with the other two doctors would suggest, while P8 spoke more about them with D3 than the other doctors. It is at this point that the doctor's influence makes itself more felt. For while the doctor cannot elicit more material on these topics than the patient is prepared to give, the *actual* amount of material produced in any particular interview on any particular subject must be conceived to be a function of the interaction between doctor and patient, i.e., to be partly dependent on the doctor's interviewing behaviour. This influence may derive from such obvious factors as the type of questions asked, and the kind of topics raised, but it may also rest on more intangible aspects of expressive behaviour in speech, some of which the various techniques and measures used in this investigation attempt to seize.

Having observed that P7 and P8 reacted linguistically in diametrically opposite ways to D3 (while they had not done so in their interviews with D1 and D2) the obvious question was whether D3 himself behaved differently with these two patients.

It is, of course, quite conceivable that two different individuals react in diametrically opposite ways to an interviewer whose interviewing behaviour remains unchanged from one case to the other. However, to satisfy oneself whether this was the case it was necessary to analyse D3's interviewing behaviour with these two patients. For in the event of their opposite reactions to him coinciding with a reversal in his own behaviour from one case to the other, we would have before us an example of interaction manifesting itself through the fluctuation of the various measures used in this investigation.

2. *D3 Interviewing P7 and P8.*

The analysis of D3's speech behaviour demonstrates clearly that such interaction did actually take place. Table VIII and Diagram III shows that D3's interviewing behaviour in his interview with P7, as embodied in the various time and language measurements, was the inverse from that in his interview with P8.

With P7, D3 had a relatively low activity rate, but with P8 a high one. His tempo of interaction (A + S) was faster than his mean for all ten inter-

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views, when talking to P7, and slower in his interview with P8. His silences were longer with P7 and shorter with P8. His periods of speech activity were shorter than his mean in both cases, though somewhat longer with P7 than P8. During both interviews there was not much difference in the proportion of total time spent in talking to the two patients, but taking into account the difference in the rate of word production (236·4 with P7 and 148·5 with P8) the total word output of D3 for each minute of interviewing was 42·6 words

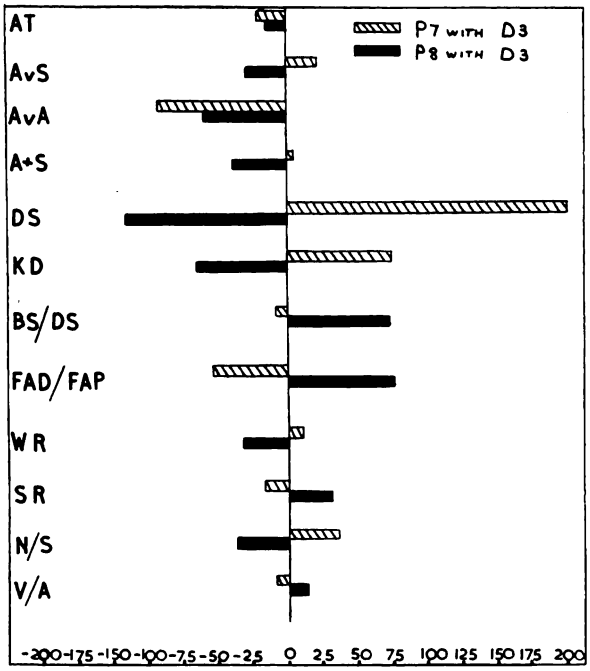

DIAGRAM III.—Deviations from mean expressed as percentages of mean : D3 with P7 and P8.

with P7 and 28·2 words with P8. Altogether he presents with P7 a much more dominant picture—as perhaps one may call it—(K = 75·0) than with P8 (K = −67·0), and one in which adjustment is characterized by periods of mutual silence which were longer than this interviewer had with other patients. Contact with P8, on the other hand, is far more close and lively, with some overlapping talk rather than silence. With respect to parts of speech used, the language of D3 is distinguished by the fact that with P7 his language contains more than his mean proportion of nouns and less of self-references, the noun/self-reference quotient being well above the mean figure, the case with P8, on the other hand, being the reverse. His verb/adjective quotient in a similar manner swung into reverse direction, being below the mean when talking to P7, and above the mean, i.e., talking more in terms of action with P8.

All round we may say that with P7, D3 was more dominant, having a slower tempo of interaction (less participation, more indifference), a higher word output, a faster word rate, double silences and a quality of language indicating

that he was more impersonal, his questions bearing reference to objective things rather than to the patient's self. The speech behaviour of P7 is characterized by unusually fast talking alternating with periods of mutual silence. The quality of the language of P7 and the content of his conversation shows a reduction, compared with the material he produced with the other two doctors, of topics of emotional import, or dynamic force (V/A), and of reference to the self.

VII. Further Analysis of D'3s Conversation when Interviewing P7 and P8.

Origin of Discrepancy in Case P7.

The analysis of the records of P7 was pursued a step further in the hope of getting nearer to an understanding of the situational background of the intra- and inter-speaker displacement of the various linguistic modes of action and of content which we could measure. Working on the assumption that in the interviews the roles of the interlocutors were such as to invest the interviewer with the main initiative, D3's records with P7 and P8 were analysed in respect of type of questions asked and of responses offered in the two cases.

1. *Classification of Quantitative Data.*

Before discussing the qualitative aspects of D3's responses to the two patients in question, some figures which illustrate the quantitative side are given in Table IX.

Table IX.

	Tt.	SA.	FAm.	SVA.	FVAm.	FAm–FVAm.
P7	19·9	223	11·6	143	7·5	4·1
P8	10·6	208	19·6	67	6·3	13·3

Tt = Total time of interview in minutes.
SA = Sum of the doctor's actions during the whole interview.
FAm = Frequency of his actions per minute of interview.
SVA = Sum of doctor's verbal actions over the whole interview.
FVAm = Frequency of his verbal actions per minute.
FAm–FVAm = Difference between the frequencies of all actions per minute and verbal actions per minute giving a measure of the number of non-verbal actions per minute.

From Table IX it can be seen that the difference in the frequency with which D3 acted in each unit of time during the two interviews had an opposite trend when the verbal actions are separated from the gestural ones. The latter were mainly nods of the head. While D3 talked somewhat more often when interviewing P7, he nodded very much more often when interviewing P8. This we may take as an indication that his attitude towards the latter was more of a permissive or acquiescent kind than that towards P7.

2. *Classification of Qualitative Data.*

A classification was then made of all that D3 said under the following heads :

1. Questions initiating topics of conversation.
2. Questions following up topics initiated by the patient.
3. Arguments, remarks, observations.
4. Responses.

The following picture emerged: The overall distribution of the number of D3's verbal actions under these four heads differed considerably in the two interviews. These figures seem already an indication that D3 took a more active interest in what P8 had to say than in P7's remarks. For while only 20 per cent. of his conversation with P7 was devoted to questions *initiating* areas of discussion, as much as 30 per cent. of his conversation with P8 had that end in view. On the other hand, there were relatively more responses of the passive type in D3's conversation with P7 (68 per cent.) than in that with P8 (59 per cent.). The proportion of follow-up questions was the same in both interviews.

An even greater difference in D3's interviewing behaviour with these two patients emerges when we analyse the figures with respect to the kind of area touched by the questions and to the quality of response. While in the conversation with P8, 25 per cent. of all D3's verbal activity was given up to questions initiating the discussion of the former's *illness and mental state*, the corresponding percentage was as low as 3·5 in the interview with P7. The largest single group of questions with this patient (7 per cent.) occurred at the beginning of the interview, and were concerned with his name (an unusual French name). The patient's work, and his qualification for a job to which he aspired (but for which he lacked qualifications), accounted for a further 5·5 per cent., while 3·5 per cent. of the questions were concerned with testing the patient's information. Taking the questions initiating topics and the follow-up questions together, it is clear that D3's overt enquiries were concerned with the patient's occupational life far more than with his mental condition. With P8, D3 was bent mainly on obtaining material concerning the patient's mental suffering.* The nature of the material produced by the two patients showed, as was to be expected, the correspondence of the doctor's questioning with the material he obtained.

As to the responses, these were separately tabulated in Table XI, giving the following picture.

Three of the classes which emerged were identical for both interviews: (*a*) the class of "Yes," "Oh I see, yes," "Yes, I see," "Quite," "I see," etc. We shall call these the affirmative type of response; (*b*) The "Hms," and "Hum-hms," which we may call the reflective type; and (*c*) the repetitive affirmative type, such as "Quite, quite," and "Yes, yes."

Apart from these classes there was only one other major group of responses, which may be called interrogative responses, namely (*d*) the "Oh! really?"; "Did you?", "Have you?", "Are you?", "Indeed, indeed, indeed?". Items in this group occurred *only* in the interview with P7.

The most striking differences in D3's responses to P7 and P8 are to be found in the proportions of the type of responses employed. When interviewing P8, 33 per cent. of all his verbal actions were of the affirmative kind, as against 22 per cent. in the interview with P7, while the latter came in for a type of response (12 per cent.) which D3 never used with P8, namely the interrogative.

* There was, to be sure, an objective basis for this difference of emphasis. P7 showed no signs of mental illness in his behaviour, but was rather more remarkable by reason of the absence of any symptoms. He had been in the hospital with anxious depression and was about to leave. Indeed, his problem at this stage was one of finding a suitable job.

TABLE X.—*Frequency Distribution of D3's Responses to P7 and P8.*

P7. Responses.	Frequency (%).	P8. Responses.	Frequency (%).
Yes ! ; Oh I see, yes ! ; Yes, quite ! ; Quite, I see !	22	Yes, I see ! Yes, I see ! Hum, yes	33
Hum ! Hum ! Hum ! .	15	Hum !	15
Quite, Quite ! Yes, yes .	12·5	Yes, yes	9
Oh ; really ; did you ; have you ; are you ; indeed, indeed	12		
No, no	3		
No	1·5		
That is good . . .	1·5	No, yes	1·5
	67·5		58·5

We can thus see that the difference in the *quality* of the verbal activity of D3 when interviewing these two patients forms a meaningful background to the differences which were observed in his interviewing behaviour with them as described in *quantitative* terms, as well as with the differences in the quantitative picture of the *patients'* behaviour.

Continuing the search for a further explanation of this difference it was decided to track down the class of interrogative responses which had emerged as a specific feature in D3's language behaviour towards P7. The study of the context in which these appeared showed (*a*) that most of them were reactions to a certain exaggerated self-importance or gushing optimism in the patient's statements, e.g., when answering the question how he was getting on, " Oh, I feel better than I have been for years " (D3's response : " You do? ") and (*b*) that they were concentrated in the first 108 words of D3's output, i.e., the first 13·4 per cent. of his total output of 804 words. These 108 words were concerned with the subject of the patient's strange name and constituted as stated above the largest single group of the doctor's initiating questions. Nine of the total number of seventeen interrogative responses (i.e., 53 per cent.) occurred in this part of the interview, a figure which is far in excess of that expected in relation to its length. A chi-square calculated to test the significance of the deviation of the observed from the expected number of interrogative responses for this passage was 20·0, normally far beyond the 0·001 level of significance. We can therefore accept the results as significant in spite of the fact that the entry in one cell was below 5.

The indication is thus that D3's particular attitude in this interview with P7 as manifested in the various language and temporal aspects of his conversational behaviour emerged already at the very outset of the interview, when the subject of the patient's name was dwelt on at great length.

VIII. CONCLUSIONS.

The original purpose of this study had been to test a number of linguistic categories obtained from psychiatric interviews for consistency or relative invariance in respect of individuals. The conclusion arrived at was that some

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temporal as well as grammatical categories of speech behaviour are relatively constant, i.e., subject to habit formation of differing strength.

Two of the measures investigated in this study caught our attention by their capacity to combine general stability and plasticity: these were the speech rate (WR) and the self-reference percentage. There was, however, an essential difference between these two measures. The speech rates of doctors and patients ranged within the same universe (see Tables I and II), while the universes of self-reference percentages for the doctors and patients were widely separated. In other words speech rate was not only consistent for individuals but also independent of the rôle of the speaker in the interview, while the self-reference percentage showed invariance only within the doctor or patient groups, i.e., when the role and purpose of the speaker were held constant. In view of this superior degree of stability of the rate of speech, its discrepancies observed in individual patients, particularly P7 posed the question as to whether they were not indicative of reactions at a deeper level to changes in the situation-complex of the interview. The detailed analysis of all the measures available showed that the discrepancy of the speech rate was symptomatic of a total change in linguistic activity involved in the interviews concerned.

Shifts in any one category of linguistic behaviour seem to have been balanced by concomitant changes in some other categories. In addition, shifts within the conversational pattern of one speaker coincided with a rearrangement of the linguistic pattern of his interlocutor. Furthermore, the interviews which in the first place had been singled out on account of their discrepant speech rates showed wide differences of content, i.e., of the material elicited by the interviewer and the type of his questions and responses. Altogether a change in the subject discussed was accompanied by compensatory changes in the records of both speakers, of duration, rhythm, output and rate of talking as well as of some of the grammatical categories used. From this it seems that interaction operates by permeating the various categories of conversational behaviour, linguistic, temporal and in respect of content.

The picture which has thus emerged recalls Humphrey's (7) summary when surveying the field of evidence on the relation of thinking to the activity of language: namely that speech activity is a unitary process blending aspects of the utterance function of language with content or meaning into a closely-knit whole. Humphrey admits that the divsion of language into the three functions of utterance, reference and evocation, is useful for purposes of scientific abstractions, but rejects them as aspects of actual language behaviour. "The fundamental datum of speech is the fact that a man is *doing something*, namely talking *to* somebody *about something*. He is specifically reacting to a total situation complex comprising non-social and social—or, as Kantor (8) calls them, "bi-stimulational"—features." Our evidence is in keeping with this conception.

Our results have also shown that the constancy of linguistic units in the general structure of language, which linguistic science has established, is reinforced by personal habits of individuals. They also illustrate the *ad hoc* adaptiveness of this structure in accordance with the "total situation complex," maintaining balance internally as well as adjusting to the interlocutor.

VIII. Summary.

1. Thirty interviews were recorded on an interaction chronograph for time measures, and in a speech recorder. They were conducted by three psychiatrists who each interviewed the same group of ten patients (composed of two sub-groups suffering from anxiety or depression respectively).

2. Certain time measures had previously been shown to be consistent for individual doctors and the two sub-groups of patients.

3. Owing to some spoilt recordings only 25 of the 30 interviews could be transposed to verbatim manuscript form.

4. A grammatical analysis and word count of the language used by doctors and patients was then undertaken. The following measures were subjected to analysis of variance: percentage of nouns and self-references in the total number of words, noun/self-reference ratio, verb/adjective ratio, word or speech rate measured by the number of words per minute of the conversation (i.e., of the individual's action time, *not* the interview time) or word rate.

5. The results were: highly significant consistency of word rate and self-reference percentage, and of noun/self-reference and verb/adjective ratios, and consistency at the 5 per cent. level of nouns and adjectives for the doctors.

6. For the patients only the verb/adjective ratio proved consistent at the 5 per cent. level, when the figures from all these interviews were compared, but word rate and self-references correlated highly only for interviews with D1 and D2, while in interviews with D3 discrepancies occurred.

7. The most extreme discrepancy occurred in the case of Patient 7 (P7) and as the discrepancy in the case of P8 was, on three counts, (word rate, self-reference percentages and action time), consistently in the opposite direction, the two cases were subjected to a detailed comparative study, linking up the temporal and grammatical quantitative investigation with a structural topic analysis of the content.

8. Data from the available records suggest that word rate, self-references and action time for the patients varied concurrently, word rate correlating inversely with self-references and action time, and action time directly with self-references.

9. The juxtaposition of the discrepancies of P7, and P8 with D3, and of D3 with P7 and P8 over the range of 12 (for patients 13) measures of temporal and linguistic conversational behaviour (and patient's word output on the subject of his illness) shows that other modes of linguistic activity had also changed.

We were thus able to illustrate in terms of objective measurements that language functions as a unitary process blending aspects of utterance and of content into a closely-knit whole.

10. A classification of D3's questions and responses resulted in the location of that part of the interview where the discrepancy had its roots.

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