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ABSTRACT

A study was conducted to determine criteria to measure successful language development and to determine what factors might be considered to be the determiners of this development. Subjects were 16 children, aged 3 years 3 months, selected on an intuitive basis from the 64 children in the older age group to represent the full range of development, from most advanced to most retarded. The data for comparison were of two kinds: samples of the children's spontaneous conversation recorded in their own homes on a time sampling basis over a complete day and subsequently transcribed and linguistically coded and scores on a test of comprehension. Measures considered were mean length of utterance, syntactic complexity, auxiliary verb system, semantic complexity, and pragmatic range. Teachers' assessment of children's language development was also considered. It was concluded that the factor here called "command of the language system" could be readily discerned in the speech data and that the range of pragmatic functions in the speech addressed to the child was the best predictor of the child's language development. Study findings also suggested that there may not be a close relationship between command of the language and effective communication. (Author/MS)

What Makes for Successful Language Development?

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The making of value judgements is an essential part of the educational enterprise - whether of what the curriculum should contain, how it should be taught, or how far individual children have acquired the knowledge and skills that it is considered desirable for them to have acquired - and it is right that this should be so. However, it is equally important that these value judgements should be based on the most reliable evidence available and made in full knowledge of the interdependence between what a child is said to know or be able to do, the conditions under which this knowledge or ability has been acquired, and the manner in which it has been measured .

One particular form of ability about which such value judgements are constantly being made is competence in language. In the early years, in particular, linguistic ability is one of the chief bases of assessment, and restricted or retarded language development is one of the criteria used in deciding whether a child should be given a place in a nursery school or included in a remedial programme. Yet when one examines the criteria and instruments that are used in assessing linguistic ability, it becomes apparent that there is very little specification in detail of what is to count as successful language development at any given age, and even less certainty about the validity of the measures used.

My title is deliberately ambiguous, however, for I also wish to consider, in a preliminary way, what factors might be considered to be determinants of successful language development, both in the pre-school years and in the curri-

culum, overt and hidden, in the first years of schooling. Before one can consider causation, however, one must have reasonable confidence in one's criterion of success and in one's ability to measure it, so it is to this issue that the first part of this paper is addressed.

Measures of Language Development

A review of the literature on language development clearly indicates the need that researchers and clinicians have felt for some way of comparing the progress of individual children in acquiring language, and a variety of measures have been used. Crystal et al (1976) review a number of these and find all of them more or less inadequate, either because they consider them to be unreliable, as in the case of mean length of utterance (MLU); or linguistically inappropriate, as in the case of counting parts of speech; or arbitrarily selective, as in the case of the various check-lists that have been employed, e.g. Reynell's (1969) Expressive Developmental Language Scale. These criticisms are probably well-justified, but given the very great amount of time that is required to carry out a full linguistic analysis of a sample of spontaneous speech and the difficulty of knowing what weight to give to the various aspects of the result, one can understand the desire for some summary measure that can be quickly derived from the data.

The search for such a summary measure was the point of departure for the present investigation, as some method of initially ranking the 128 children in the sample was required prior to carrying out further analyses[1]. However, in view of the doubts that have been expressed about the validity of any single measure, we decided to carry out a comparative evaluation of different measures of the language ability of a sub-sample of the children, in order, if possible, to discover which was the most satisfactory measure of development. The

subjects for this investigation were 16 children, aged 3 years 3 months, selected on an intuitive basis from the 64 children in the older age-group, to represent the full range of development, from most advanced to most retarded. The data for comparison were of two kinds: samples of the children's spontaneous conversation recorded in their own homes on a time-sampling basis over a complete day, and subsequently transcribed and linguistically coded (Wells 1973), and scores on a test of comprehension. A number of measures were derived from the speech data, and these were compared with each other and with the test scores, in order to discover the relationships between them.

The following measures were considered (the children's scores on each are shown in Table 1, columns 1-10):

1. Mean Length of Utterance. This is probably the measure that has been most frequently used by other researchers, either as a measure of language development in itself (e.g. McCarthy, 1930, and studies reported in McCarthy, 1954), or as a basis for grouping samples of children's speech for further investigation of developmental characteristics (e.g. Brown, 1973). In the present study, MLU has been counted in morphemes, using Brown's criteria (1973, p. 54). The first measure, MLU (All), was based on all coded utterances from one recording, and the children's means ranged from 1.5 to 4.7 (mean of means: 3.33 morphemes, S.D. 1.00). However, we considered that this measure might not represent all children equally fairly, since being an average it can be unduly affected by conversational demands for one-word responses (Shields, 1972) as well as by the children's "sentence programming span". We, therefore, constructed a second measure, MLU (Structured), by excluding all unstructured utterances such as 'Yes', 'No', 'Please', 'Hello', etc. (cf. Morehead & Ingram, 1973), and on this measure the children's means ranged from 2.0 to 5.39 (mean of means: 4.10 morphemes, S.D. 1.14) In order to discover

whether our supposition was correct that a rank order of MLU based on all utterances would be biased by the conversational demands of the situation, we also ascertained the proportions of structured utterances in the speech samples that were used in calculating MLU (Str.). These ranged from 51.6% to 88.6% (mean: 71.4%, S.D. 9.6%). A third measure [2], Mean Length of Longest Utterance (MLU(L)), was also calculated, using the three longest utterances by each child, in order to have a measure of maximal ability, as estimated by utterance length. Scores on this measure ranged from 3.3 to 14.0 morphemes (mean: 9.6, S.D. 3.1).

2. Syntactic Complexity . In their discussion of methods of assessing language development, Crystal et al (1976) argue for the centrality of syntax, and they offer a method for deriving a syntactic profile. Essentially the same procedure was used here, except that the analysis stopped at the level of clause constituents, with auxiliary verbs being treated as clause constituents in their own right. Utterances ranged in structure from one-constituent utterances to utterances consisting of three clauses, main, subordinate and tag, with 12 constituents in all. 34 structural types were defined and these were grouped into 5 stages, using the developmental sequence proposed by Crystal et al (op. cit.). The children were then given a weighted score according to the number of types from each stage manifested in their speech sample. The highest-scoring child had 26 types, with a high proportion of Stage IV and V types; the lowest scoring child had only 7 types, with only one of these being above Stage II.

3. Auxiliary Verb System. This system is particularly interesting in the acquisition of English, as it is centrally involved in the syntactic realisation of the semantic categories of modality and aspect and of the pragmatic functions of questioning and 'speech act modulation', and one would

expect considerable differentiation in control of this system between children of the age being studied (3 1/4 years). A similar procedure was adopted here to that for syntactic development. 18 different categories of auxiliary verb use were defined, including 7 categories of modality; 3 ways of signalling future reference; continuous and perfective aspect; passive; and various 'surface' uses of an auxiliary verb, such as 'do-support', 'have' in 'have got', etc. These were arranged in a tentative developmental sequence of four stages and the children scored according to the number of types manifested from each stage. The highest scoring child had 10 of the types, spread across all four stages, whilst the lowest scoring had only 1 type, 'do-support'.

4. Semantic Complexity. It has been argued (Slobin, 1973) that children acquire formal distinctions in order to encode distinctions of meaning that are already available to them. A further important measure of development, therefore, might be the number of semantic distinctions encoded in their speech. Two semantic measures were constructed. The first was a measure of Semantic Range. I have argued (Wells, 1974b) that each simple sentence expresses one major semantic relationship between the participants involved (e.g. Agent, Patient, Location, etc.), and that these relationships can be described in a two dimensional matrix, of which one dimension concerns the State of the central participant, usually the Patient, and the other dimension concerns the Dynamics of the relationship, whether static or changing and, if the latter, whether the cause of the change is specified. Thus "The marble is on the table" is an example of Static Locative State, whereas "The boy put the marble in his pocket" is an example of Dynamic Locative State, Agent specified.

For this analysis only 22 States and the simple static/change distinction were employed, with some further specification of type of [illegible] or location, and an additional distinction between co-referentiality [illegible] of Agent and Patient. This yielded 39 semantic clause types, which was sufficient to describe all but one of the analysable utterances. The measure employed was simply the number of different clause types expressed in each child's speech sample, and the scores ranged from 11 to 27 (mean: 22.1, S.D. 4.8).

The second measure of semantic complexity concerns the range of optional Semantic Modifications of the whole clause used by each child. These include specification of time, aspect, modality and manner, and the various relations between clauses, such as cause, reason, purpose, etc. Again the measure was simply the number of different types of modification expressed in each child's speech sample, and scores ranged from 4 to 23 (mean: 14.9, S.D. 6.6).

The number of different distinctions is obviously a somewhat crude measure, as some of these distinctions are acquired much earlier than others. At the present stage in our analysis, however, it is too soon to arrange these in a developmental scale with any confidence, as was done for the syntactic types (but cf. Wells, 1974, for a preliminary attempt to identify a developmental sequence of acquisition for semantic clause types).

5. Pragmatic Range. Just as, in one sense, a child acquires language in order to express distinctions of experiential meaning, so in another sense, it is interpersonal and pragmatic meanings that are the spur to further learning (Halliday, 1975; Wells, 1975). It is important, therefore, to include a measure of the functions that the child uses language to perform. The analysis of this aspect of children's utterances is

essentially an adaptation of Speech Act theory. It makes use of a taxonomy of pragmatic functions that individual utterances perform, e.g. Command, Why Question, Justification, etc. (cf. Dore, 1975); but, in addition, these various functions are further classified according to the purpose - Control, Expressive, Representational, Social, Tutorial, Procedural - of the superordinate conversational sequences of which they are a part. Since there is as yet no firm evidence on which to base a developmental scale of pragmatic functions, the measure used was simply the number of different functions expressed by the utterances of each child. Scores ranged from 22 to 42 (mean: 30.7; S.D. 5.6).

6. Test of Linguistic Comprehension . In order to complement the data obtained from sampling spontaneous speech, a test of linguistic comprehension was administered to each child within a few days of the recording. The test utilizes the 'acting-out' mode of response and consists of 63 items of increasing difficulty. The measure here was the number of items responded to correctly. Scores ranged from 23 to 40 (mean: 33.4, S.D. 4.6). As this was the first experience of being tested for most of the children, the scores must be treated with some caution. Some children take more easily than others to the test situation and this almost certainly affects their performance; of these 16 children, one was so intimidated by the situation that he refused to co-operate altogether, and several others were noted to be uncomfortable, in spite of the efforts of the tester to establish good rapport before starting the test.

Results and Discussion

Scores on all these measures were inter-correlated using the programme BMD X 72 for factor analysis. The results are presented in Table 2, rows and columns 1-10. As will be seen, the measures of utterance length, and of

syntactic and semantic development correlate highly with each other (better than $r = .70$, $p<.01$ in all cases), whereas none of these measures achieve a significant correlation with the range of pragmatic functions and only at the .05 level with the Comprehension Test in the case of Syntactic Complexity and the Auxiliary Verb system.

The low correlations in the case of the Comprehension Test can probably best be explained in terms of the unreliability of individual scores on this first occasion of testing. The fact that correlations achieve significance at the .05 level with respect to the more syntactically oriented measures reflects the content of the test itself: the dimension on which the items most clearly increase in difficulty is that of syntactic complexity.

The complete lack of relationship between the Range of Pragmatic functions for which the children used speech and the measures of control of the linguistic system is more puzzling. What this result seems to show is that a child's ability to communicate a wide range of pragmatic intentions is, at this age, not significantly related to his degree of command of the semantic and syntactic options in the language; or, to put it differently, the same purpose can be achieved in linguistically more or less complex ways. Of course, this does not mean that the different ways are equally effective when it comes to the finer shades of meaning, and the explanation of the lack of correlation may simply lie in the crudeness of the measuring instrument. To give equal weight to each function, as we have done, necessarily obscures qualitative and developmental distinctions which are almost certainly present in the data. Furthermore, because the number of function categories to which an utterance can be assigned is large, the range actually occurring in a particular speech sample may under-represent the child's ability if he

is not particularly talkative, to an extent that is not true of the other measures. However, when all these qualifications have been made, there seems to be a greater independence between form and function than might have been expected.

Proportion of Structured Utterances, as anticipated, correlates more highly with MLU calculated on all utterances than with MLU calculated only on structured utterances or with any of the other measures. This indicates the susceptibility of MLU (All) to the demands of the conversational context in which the speech sample is collected, even though the two measures of MLU are themselves very highly correlated.

The remaining measures, MLU (All), MLU (Structured), MLU (Longest), Syntactic Development, Auxiliary Verb, Semantic Range and Semantic Modification are all highly inter-correlated, indicating that the length, form and meaning of an utterance are closely related, at least in the speech of 3 1/4 year olds.

In an attempt to gain further insight into the relationship between them, nine of the variables were submitted to a factor analysis, with the number of factors to be extracted limited by setting an eigen value of 1.0. This analysis yielded only two factors, the first of which accounted for 63% of the variance and the second for a further 15%. The loadings of the nine variables on the two factors in the rotated factor matrix are shown in Table 3. Factor 1 clearly represents something that could be described as 'Command of the Language System'. The highest loading on this factor is Semantic Modification (.95) and the second highest is Auxiliary Verb (.90). These are both measures which were predicted to be particularly sensitive at this stage of development, which is characterized by acquisition of the semantic and syntactic systems for modifying the basic clause. MLU (Structured) (.86), Semantic Range (.85) and Syntactic Development (.84) also have high loadings

on this factor, confirming both the descriptive label given to the factor, and the closeness of the relationship between MLU (Structured) and the semantic and syntactic measures. MLU (All) has a somewhat lower loading (.78), as we might have predicted; and Pragmatic Range (.57), Comprehension Test (.37) and Proportion of Structured Utterances (.29) have even lower loadings.

Factor 2 is more difficult to label. The highest loading is for Proportion of Structured Utterances (-.86), with Comprehension Test (-.58), Pragmatic Range (.57) and MLU (All) (-.47) having much lower loadings, and the other variables hardly contributing at all. The direction of the loadings suggests that this factor may represent a combination of a high proportion of unstructured utterances and a tendency towards low score on the comprehension test, and towards an extreme score, high or low, on pragmatic range. If this is the case, it is little more than a residual factor, with no strong identity of its own. However, the identification of factors by means of a factor analysis can be no more than a heuristic device, since the factors that emerge depend so heavily on the particular mixture of variables from which they are derived. The lack of clear identity for the second factor, therefore, is not too disturbing, as the majority of the variables considered contribute substantially to Factor 1, and this factor is unequivocally identifiable.

If individual child loadings on Factor 1 are taken as providing a baseline rank-order of development, we can now ask which of the separate measures used provides the best estimate of level of development. The children's scores in Table 1 have been set out in terms of rank order on Factor 1 in order to facilitate comparisons. Clearly none of the measures compared gives a rank order that matches exactly with any of the others. This suggests that command of language is a complex of abilities, and that particular children may be more advanced in one aspect of language and less in another. No one

measure, therefore, can give a really accurate picture of an individual, nor accurately rank him with respect to other individuals. At age 3 1/4 years, of the measures investigated, those that record the child's progress in mastering the auxiliary verb system and semantic modifications of the clause, seem to be the most powerful, but a year earlier or later they would probably be much less satisfactory. *MLU (Structured) and MLU (Longest) also seem reasonably satisfactory at this age (although Joanna C., for example, who is ranked first on Syntactic Development, Semantic Range and Semantic Modification, as well as on Factor I, only achieves rank 5 on MLU (Structured) and rank 4 on MLU (Longest). MLU (All), on the other hand, is much less satisfactory, for the reasons already given.

The chief problem with MLU as a measure is that, beyond a certain stage, it becomes the outcome of two conflicting tendencies. On the one hand, with the development of command of the language system as such, there is a tendency for utterances to become progressively longer, as more complex intentions are realised in utterances which conform more and more closely to well-formed adult utterances, in which all the necessary grammatical elements are present. On the other hand, there is also a development towards situationally appropriate speech, of which one of the characteristics is succinctness. Appropriate elliptical utterances begin to occur considerably before 3 years, and other forms of compression, such as the use of a nominal modifier in place of a qualifier phrase, are learnt within the following two years. By age 5, MLU is definitely no longer a reliable measure: of the six most advanced children in this sample at age 3 1/4, four have an MLU (Structured) at age 5, based on a speech sample obtained under similar conditions, which is actually lower than at age 3 1/4.

The conclusion that seems inescapable, from the data considered here at least, is that there is no one measure of language development that gives a full picture of a child's level of development, nor one that has continuing

validity over the whole pre-school period. Particular individual measures may be valid discriminators between children at a given age, as Auxiliary Verb or Semantic Modification seem to be at this age, but probably the best solution is to construct a profile that covers the various dimensions of language on which children differ. One of the aims of our future research will be to seek to identify more precisely what these dimensions are.

Predictor Variables in the Child's Environment

The second stage in this investigation was to discover which aspects of the children's environment were most strongly related to different aspects of their language development and thus eligible for consideration as causative factors. The traditional approach has been to seek for correlations between language development and social characteristics of the family. This was one of the approaches adopted here, although we have argued (Sinha & Wells, forthcoming) that family membership of any social group cannot of itself be considered to be causative of the child's development; the effect, if there is one, must be mediated by the actual patterns of interaction through which the values and orientations of different groups are given realisation and acquired by the child. In addition, therefore, to considering the social variable of class of family background, we also attempted to find indices that reflected the quality of the verbal interaction which the children experienced.

The first of these was Total Amount of Speech Addressed to the Child in the period of time during which the recording was made. It will be recalled that a time-based sample of equal duration was recorded for each child over a complete day with no observer present, and the family were unaware of the times at which the recordings were made. This method was employed specifically to avoid distorting the adults' normal behaviour, and as far as can be ascertained the desired result was achieved. The number of utterances addressed to the

child ranged from 43 to 300 (mean: 147.4, S.D. 76.8).

The second index was the Range of Pragmatic Functions for which the utterances addressed to the child were used. The procedure for this calculation was identical to that employed for the child, and the results were expressed in terms of the number of different functions used. They ranged from 11 to 33 (mean: 22.2, S.D. 5.2).

Since it might be supposed that it would be speech used to represent a reality absent in time or space that would be most complex semantically and syntactically, and which would thus provide the strongest motivation and the richest model for the child's learning, a further index was the proportion of utterances addressed to the child from the category of Representational Functions. The proportion varied from 9% to 47% (mean:35.0%, S.D. 10.1).

Class of Family Background was calculated by rating the occupation of each parent from 1-5, using the Registrar-General's five-point scale of social class (1=Professional, 5=Unskilled) and adding to this a rating of education, distinguishing only two categories, minimal (4 points) and more than minimal (2 points). By combining the two ratings from both parents, a scale of 12 points was constructed, running from 6 points for a child of professional parents with more than minimal education, to 18 points for a child of unskilled parents with minimal education. The children in this sub-sample received scores ranging from 6 to 17 (mean: 12.4, S.D. 3.9).

Results and Discussion

The scores for all these measures were added to the first stage of the factor analysis programme to yield correlations with each of the measures of the children's language. The results are shown in rows and columns 11-14 of Table 2.

The first point to note is the apparent insignificant effect of the Amount of Speech addressed to the child. However, a cluster of highly significant effects is centred on the Range of Pragmatic Functions in the speech addressed to the child and this in turn is positively correlated with the amount of speech. Proportion of speech with Representational functions, on the other hand, is not significantly related to any of the child variables, which seems to suggest that the use of language by others to carry out a wide range of functions, when speaking to the child, gives him more assistance than using speech chiefly to convey information and to represent an absent reality. Whether this assistance is due to a greater variety of model utterances for the child to learn from, or to an increased motivation because of the greater range of experience in which language plays a part, has still to be discovered. Whatever the reason, children to whom others address utterances across a wider pragmatic range, themselves have a wider Pragmatic Range as well as a wider Semantic Range and control of the Auxiliary Verb system, these relationships all being significant at the .01 level. They also have a significant tendency to produce longer utterances ($p<.01$) and a tendency, which almost achieves significance, to more advanced syntactic development.

Class of Family Background, as might be anticipated, shows significant correlations with a number of the child measures, but not such high correlations as those already discussed. It is interesting to note that there is a higher correlation between Class and proportion of Representational speech by others than between Class and the Pragmatic Range of others' speech, whereas it is the latter which is significantly related to characteristics of the children's speech.

It is in relation to the Comprehension Test that Class of Family Background is most powerful as a predictor ($r=.64$, $p<.01$). This seems to be best explained in terms of the differential experience of test-like situations

between children from different backgrounds. It will be interesting to see whether this difference is attenuated over the course of the study as all the children become more familiar with the tests.

However, a note of caution must be sounded with respect to all the correlations involving Class of Family Background. Although the sub-sample for this investigation was chosen to cover the full range of intuitively judged linguistic development, it is not representative of the sample as a whole on demographic criteria, since the two extremes of class of family background are over-represented. When MLU (Structured), for example, is correlated with Class of Family Background for the whole sample of 66 children, the result is still significant ($p<.05$), but the scatter diagram, which is reproduced as Figure I, shows that this result is caused by the few children at the extremes, particularly the lower extreme, whilst for the majority of children, there is no such strong relationship.

Whilst these results, therefore, fall far short of identifying precisely what factors in a child's environment determine the differences in success on the various dimensions of language development that have been measured, the fact that one of the measures of verbal interaction experienced by the child, namely Range of Pragmatic Functions by others, correlates highly with a number of the child measures is an indication that it is through a more detailed examination of the child's linguistic experience of conversation that an explanation may ultimately be found.

Teacher Assessment of Children's Language Development

Finally, I want to turn to the question of how these relatively objective measures of children's language relate to the assessments made by teachers. On the whole, teachers are not equipped to make the sort of detailed assessments that we have been considering, so what sort of criteria do they use?

We asked a number of teachers to list their criteria and then we presented this list to the teachers of all 66 children in the sample and asked them to rate the criteria in terms of their "educational importance". Almost all were rated important or very important, but within this range they fell into three bands:

Most important were the ability to understand and use the normal range of infant vocabulary, and to express their own ideas in words.

Almost as important were the ability to follow simple instructions, and to understand a simple story and other people's conversations. This was closely followed by the ability to express ideas fluently.

Then followed the abi lity to understand and give simple descriptions, and to tell a simple story and give simple instructions.

Of only average importance was the ability to express complex ideas, whilst standard dialect and standard accent were generally considered to be of little importance.

There was a very high degree of agreement about the relative importance of most of these abilities; only for the importance of dialect and accent did the teachers split into two groups, a small group of 8 or 9 considering the use of the standard dialect and accent to be just as important as other abilities considered.

We next asked the teachers to assess the children on these criteria, using a 5-point scale from very low to very high. The results are, at first sight, rather surprising. Although the ratings ranged quite widely over the scale, the aggregate scores did not discriminate very strongly between the children. Perhaps even more surprisingly, of the sixteen children in the subsample investigated at 3 1/4, only two achieved an aggregate score above average, and only one of these was amongst the top eight. We had intended to

compare teacher assessments with MLU at age 5, as a form of cross-check, but as already explained, the validity of this measure was found to be suspect by age 5, and we have not, as yet, analysed the speech samples in detail. The cause of this discrepancy between predicted success, based on scores at age 3 1/4, and the teacher ratings will, therefore, have to await the more detailed analysis.

One possible explanation, however, is that, in selecting their criteria for assessment, the teachers were focussing on a rather different range of abilities from those that we investigated. Whereas the measures characterized as 'Command of the language system' are concerned with the complexity, both syntactic and semantic, of individual utterances, the teachers' assessments were concerned much more with the children's ability to use what linguistic resources they have to communicate with others, both as speakers and listeners. Perhaps what we have here, therefore, is something like the distinction made by Hymes (1971) and Campbell & Wales (1970) between linguistic competence and communicative competence. Indeed, valid objective measures of communicative ability are just what is missing from the battery of measures that we investigated. The measure of Range of Pragmatic functions comes closest to meeting this description, but even this is assessed on isolated utterances. The teachers we asked did not mention command of the language system as such - except for vocabulary - amongst their criteria, and it may well be that they are intuitively aware that, in the busy infant classroom with many children competing for the teacher's attention, educational success depends more on what the child can do with his language resources, than on how well-developed these are in themselves. At least, this is a topic that seems to need further exploration.

Conclusion

We started this investigation with the aim of discovering how best objectively to measure success in language development in order, firstly, to enable us to rank the children in our study prior to a retrospective investigation of possible environmental determinants of success, and secondly, in the hope of providing a reliable instrument for educational assessments. Although the conclusion to the first part of the investigation was that a factor which we called 'Command of the language system' could be readily discerned in the speech data we had collected, and reasonably accurately measured through a profile of scores of syntactic and semantic range and complexity, we also found a very low correlation between scores on this factor and the range of pragmatic functions for which language was used.

In the second part of this investigation we found that of all the variables describing the linguistic environment of the child, it was the range of Pragmatic Functions in the speech addressed to the child that was the best predictor of the child's language development - both of his command of the system and of the range of functions for which he used it.

The final part of the investigation, although less rigorous in its methodology, also seemed to suggest that there may not be as close a relationship as might have been expected between a child's command of the language system and the effectiveness with which he is able to use what command he has to communicate with others.

If this is indeed the case, it will be yet one more indication that the development of children's language cannot adequately be studied by attending only to the children's output, one utterance at a time. However, before we can arrive at objective criteria for the evaluation of the communicative use of language, we shall need to understand a great deal more about how we are able to carry on a conversation at all.

Notes

1. This investigation is part of a much more comprehensive longitudinal study of 'Language Development in Pre-School Children', details of which may be found in Project Reports, Journal of Child Language 1, 1. 158-162 (1976). The research is supported by Grant HR 2024/1 from the Social Science Research Council, whose help is gratefully acknowledged.

2. The use of this measure was suggested by Dr. Richard Cromer following the initial presentation of this paper. In revising the paper for publication, the children's scores on this measure have been included in Table 1 and in the inter-correlation matrix, Table 2. However, it has not been possible to calculate MLU (Longest) at age 5 and, in order not to overweight the factor analysis in the direction of sheer length, it has not been included in the factor analysis. Nevertheless, it seems likely that it will prove to be a more reliable means of ranking children on sentence length than either MLU (All) or MLU (Structured).

		1 MLU (All)	2 MLU (Struct)	3 MLU (Longest)	4 Synt. Dev.	5 Aux. Verb	6 Sem. Range	7 Sem. Modif.	8 Prag. Range	9 Comp. Test	10 % Struct.	Factor 1	Factor 2
1	Joanna C.	4.1	5.1	12.3.	14	8	27	23	36	36	71.7	1.29	0.21
2	Melanie S.	2.9	3.9	10.3	9	9	27	21	42	35	65.1	1.07	1.47
3	Joanne W.	3.4	4.4	13.7	9	9	25	20	40	29	65.3	1.02	1.58
4	Kevin J.	4.0	5.5	14.0	11	8	22	20	33	29	65.0	0.85	0.80
5	Joanna V.	4.7	5.3	10.0	10	8	23	18	34	39	86.6	0.59	-1.07
6	Anthony E.	4.6	5.4	12.0	11	9	22	20	27	37	74.8	0.55	-0.87
7	Sonya T.	3.6	4.4	10. 0	11	8	22	20	28	40	76.8	0.51	-0.95
8	Martin H.	4.7	5.2	14.0	11	10	26	16	24	33[a]	88.6	0.32	-1.72
9	Matthew L.	3.2	4.5	8.0	9	7	22	18	29	33	58.9	0.22	0.65
10	Kelly W.	4.1	4.9	9.3	9	5	25	14	29	29	76.9	0.05	-0.31
11	Lee S.	2.9	3.6	9.3	8	6	23	19	28	34	71.9	-0.17	-0.09
12	Michael B.	2.7	3.2	7.7	8	6	23	9	31	36	75.8	-0.51	-0.42
13	Simon W.	2.4	2.8	6.7	10	5	20	10	24	38	76.6	-0.99	-1.21
14	Katrina B.	2.4	2.9	6.7	5	3	19	4	30	29	73.3	-1.26	0.09
15	Christine D.	2.0	2.5	5.7	5	2	11	4	34	34	63.3	-1.46	0.69
16	Raymond P.	1.5	2.0	3.3	3	1	12	4	22	23	51.6	-2.10	1.14

Table 1 Children's Scores

a = Child unwilling to co-operate. Average score assigned.

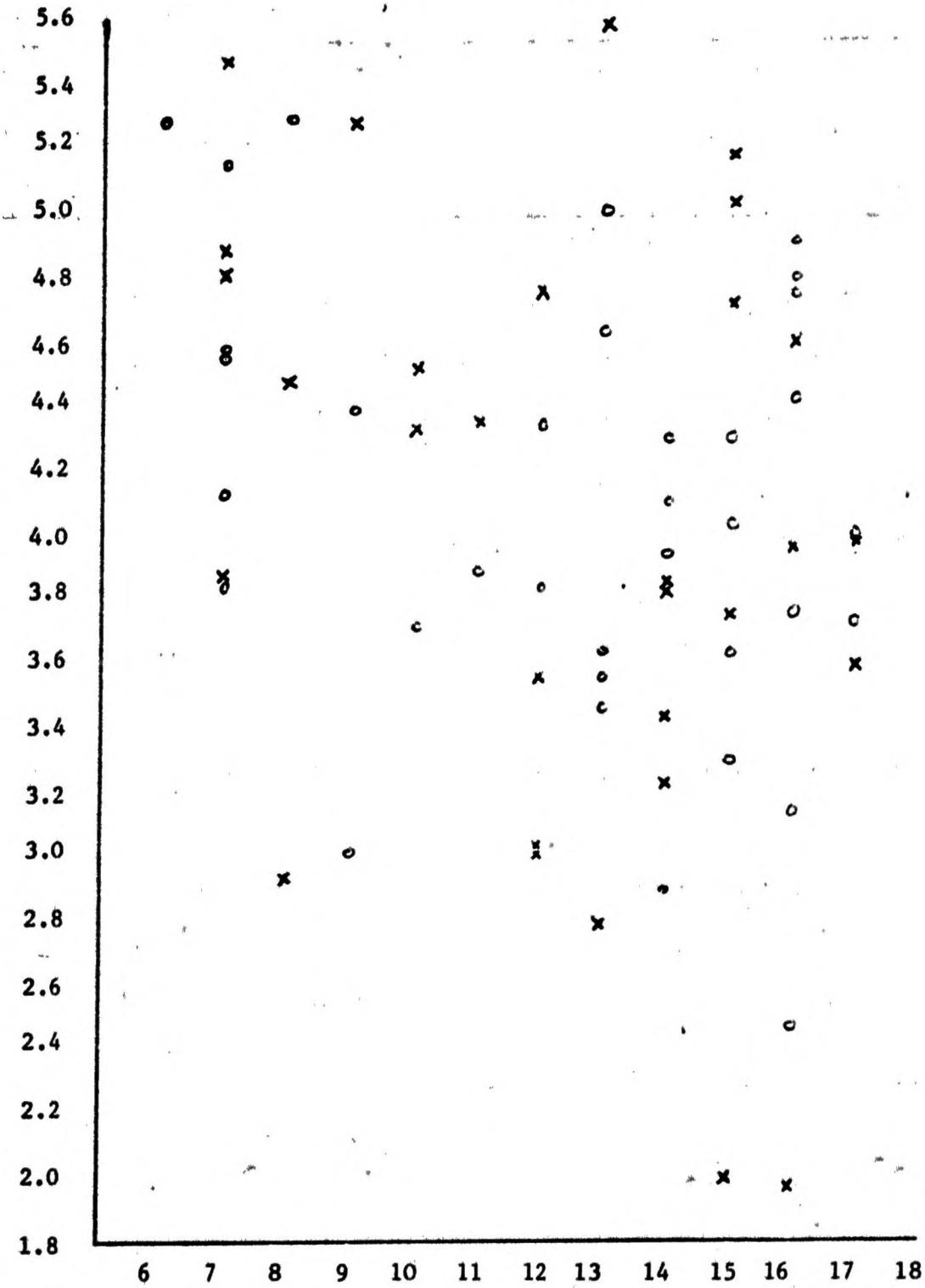
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Mean Length of Utterance (All)	1.00													
2	Mean Length of Utterance (Structured)	.96+	1.00												
3	Mean Length of Utterance (Longest)	.82+	.86+	1.00											
4	Syntactic Complexity	.80+	.82+	.79+	1.00										
5	Auxiliary Verb System	.77+	.80+	.86+	.83+	1.00									
6	Semantic Range	.69+	.71+	.74+	.79+	.86+	1.00								
7	Semantic Modification	.72+	.82+	.81+	.83+	.80+	.80+	1.00							
8	Pragmatic Range	.12	.22	.38	.20	.32	.33	.41	1.00						
9	Comprehension Test	.36	.28	.20	.58*	.51*	.42	.38	.11	1.00					
10	% Structured Utterances	.65+	.46	.40	.51*	.46	.51*	.21	-.14	.58*	1.00				
11	Amount of Speech to Child	.16	.26	.40	.19	.45	.42	-.04	.86+	.19	-.04	1.00			
12	Others' Pragmatic Range	.44	.49*	.63+	.47	.71+	.65+	.21	.81+	.39	.21	.86+	1.00		
13	% Others' Representational	.23	.27	.27	.23	.34	.16	0	.22	.05	0	.43	.31	1.00	
14	Class of Family Background	.53*	.56*	-.28	.62*	.53*	.40	.25	.19	.64+	.25	.29	.37	.55*	1.00

* Sign $p<.05$ + Sign $p<.01$

Table 2 Inter-Correlation Matrix

	Variable	Factor 1	Factor 2
1	MLU_1	0.776	-0.474
2	MLU_2	0.860	-0.275
3	Syntactic Complexity	0.842	-0.393
4	Auxiliary System	0.903	-0.258
5	Semantic Range	0.854	-0.248
6	Semantic Modification	0.950	-0.015
7	Pragmatic Range	0.565	0.571
8	Comprehension Test	0.374	-0.580
9	% Structured Utterances	0.293	-0.859

Table 3 Factor Loadings of Language Variables



MLU (Structured) x Class of Family Background (N = 66)

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