

LENGTH OF SENTENCES AS A CRITERION OF A CHILD'S PROGRESS IN SPEECH

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A child's skill in sentence structure affords a simple criterion of his advancement in the mastery of speech. I wish to propose a division of speech development into four stages dependent on the sentence; *viz.*, single words; early sentences; the short sentence of three to four words and the complete sentence of six to eight words. My reasons are two: Simplicity of determination and the real significance of each stage. The mere recording of a series of 30 or more sentences and finding their average length give us a cross-section of a child's speech development and enable us to know many things as to his progress in this distinctly human achievement.

The single word and early sentence stages have long been recognized, but the importance of the short and complete sentence seems to have been unnoticed. Unfortunately I did not discover their significance myself until two years ago, when all of my children were using complete sentences, therefore my data are not as full as I would have wished.

THE SINGLE WORD STAGE

Practically all children begin to talk with single words. This stage has been reported with 18 English-speaking children, as lasting from 4 to 9 months the average duration amounting to 6 months. In the case of 17 children of other nationalities, the use of single words lasted from 4 to 12 months, the average period being 6.6 months.

THE EARLY SENTENCES

The combining of two words previously used singly marks a distinct advance in the child's linguistic journey. The age at which the first sentence appeared with 20 English-speaking children varied from 13 to 27 months, the average being 17.5 months. With 20 children of other nationalities, the first sentence was uttered at ages varying from 13 to 23 months, the average being 18.3 months.

When a child first begins to put words together, a large part of his talking is still done in single words. For instance, during the all-day conversation of my fourth daughter, H, at two years (her first sentence had appeared four months earlier) 7 sentences of three words were used, 352 of two words, while 683 words were employed singly. This

gave an average sentence length of 1.35 words. The speech of Kirkpatrick's daughter at 28 months was evidently more advanced than that of H for she averaged 2.35 words to a sentence in a series of 100 sentences. Single sentences in this period may be fairly long, but a representative series will give an average of more than one and less than three words.

The majority of these early sentences are incomplete; this was true of 96 of the 100 sentences of Kirkpatrick's daughter. They consist mainly of nouns, verbs, adverbs, and adjectives; while pronouns, prepositions, and conjunctions appear seldom or never.

Children differ a good deal as to the number of words they can use when they first combine two; with 19 children the vocabularies ranged all the way from 14 words to 180. All of these vocabularies consist mainly of nouns; throughout this early sentence stage the child's quota of words exhibits a "baby ratio," that is, 65 per cent or more of nouns, a high proportion of interjections and sometimes also of adverbs.

How long does it take for a child to progress from his first sentence of two words to the point where he is expressing himself in sentences that average three and four words? My data on this matter are meager. With my second daughter, D, the early sentence stage lasted about 3 months, with H about 7 months, and with my third daughter, R, at least 13. Perhaps from 4 to 7 months is the usual range.

THE SHORT SENTENCE STAGE

The short sentence stage is very characteristic of the little child; it is definitely beyond the early sentence period but it is decidedly distinct from the later complete sentence stage. The child who is using this type of sentence has not yet mastered inflections and is omitting many minor words.

The following table gives the average length of sentences of 16 English-speaking children at ages varying from two to ten years.¹

¹ All but one set of these averages were based on consecutive series of sentences: Eleven on 33 to 63 sentences (Miller, H at 2½, 3½ and 4, Owen, Howard, D at 2½ and 3½ L, and N) 6 on 100 sentences (Kirkpatrick, A and E at 3 and 10); five on series ranging from 130 to 217 (Moore, Helliwell, Trettien, D at 4 and 8); one on 344 (R at 5); another on 455 (H at 3) and 6 on all-day conversations (Brandenburg, H at 2, D at 3, R at 4 and E at 5). Boyd collected 1240 sentences of his child when 20 to 24 months old and 1250 when she was 3 and 4 years old. The fact that H, E and D do not show consistent increase is due to the shortness of some of the samples; in every one of these cases, except H at 2½ and 3, the greater the number of sentences, the smaller was their average length, within the limits, of course, of their stage.

TABLE I.—AVERAGE LENGTH OF SENTENCES AT DIFFERENT AGES

Name	Child	Age in years													
		2	2 $\frac{1}{6}$	2 $\frac{1}{3}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6 $\frac{3}{4}$	7	8	10		
Moore ..	Boy	4 1													
Helliwell ¹	Girl	3 6													
Miller ..	Boy	5 2													
Nice, H	Girl	1 35			3 7	4 4	7 2	6 1							
Owen ¹ .	Boy					4 5									
Howard ¹	Boy					3 5									
Kirkpatrick	Girl		2 35		4 0		7 0								
Boyd . .	Girl	3 4			6 2		7 0								
Trettien	Girl			5 0											
Brandenburg	Girl				6 6		7 5								
Nice, E	Girl				7 1		6 1							8 5	
Nice, D. . . .	Girl			4 43	8 7	1 6	4 .					6 9			
Nice, R	Girl						3.9	6 2							
L ¹	Girl							4 1							
N ¹ .	Boy							3.1							
A ¹ .	Girl								5.0	6 0					

¹ Mrs. Sue V. Helliwell of Milwaukee, Wis., kindly gave me a series of her daughter's sentences. Owen and Howard were two little neighbors whom I had the opportunity of observing. L and N are twins, and A is their older sister.

Two of these children, H at 2 years and Kirkpatrick's daughter at 28 months were in the early sentence stage. All but three of the 31 other instances fall in one or another of two distinct groups; in 13 cases the sentences averaged from 3.5 to 4.5 words and in 15 they averaged from 6 to 8 words.

The 3.5 to 4.5 word¹ sentence first appears in the table at two years, it is common at three, and occasionally persists as late as four or even five years. At two years, three of four children were in this stage, the other not having yet attained it; at three years, three of six children averaged this length of sentence. It is evident that rather advanced

¹ Further evidence that the short sentence seems to fluctuate between 3.5 and 4.5 words and does not go as low as 3 words nor as high as 5, was shown in the all day conversation of my daughter R (Nice, '20), where the sentences are averaged hour by hour throughout the day. The hourly averages were: 3.5, 3.6, 3.6, 3.7, 3.7, 3.8, 4, 4, 4, 4, 4, 4.5

children are using this type of sentence at two years—and some doubtless earlier—whereas very many have not yet reached this point in speech development. Many three-year-olds are in this stage; besides the children cited in the table, I have recorded sample sentences of five other children of this age; two of whom used the short sentence and three the complete sentence of six to seven words; this gives five three-year-olds in the short sentence stage and six in the complete sentence stage. At three and a half there are examples of two children in each period. Probably the majority of four-year-olds have passed beyond this phase; my only example of the contrary is that of R who was very loath to learn to talk like other people. The twins who were using short sentences as late as five years of age, although of normal intelligence, were markedly retarded in their speech.

The duration of this stage doubtless varies considerably, but we have little information on the subject. With D, R and H it seems to have lasted somewhat over a year; some children must pass through it more quickly while others probably linger longer in it.

One reason for the shortness of this average sentence is the simplicity of the little child's ideas. This is indicated by the rarity of compound and complex sentences. Of 50 sentences of the five-year-old L only two were compound and none complex; of 50 of her brother N, one was complex and none compound. Kirkpatrick's daughter at three used 5 compound and 11 complex sentences in a series of sentences averaging 4 words, while at four in a similar series averaging 7 words there were 29 compound and 14 complex. A much greater contrast between the two stages was shown by R, for of 350 sentences averaging 3.9 words at four years, only 3 were compound and none complex; while of 50 complete sentences a year later, 14 were compound and the same number complex.

The other reason for the shortness of these sentences lies in the fact of the omission of many minor words and the resulting incompleteness of a large proportion of the sentences. The words most frequently left out are parts of the verb "to be," prepositions, conjunctions, auxiliary verbs, articles and pronouns.

As to the proportion of incomplete sentences, of the 100 averaging 4 words each of Kirkpatrick's daughter at 34 months, 62 were incomplete; 38 lacking the subject, and 44 the assertive verb. With my children such sentences formed the following proportions (in series of 43, 100, 200 and 218 consecutive sentences respectively): H at 30 months, 54 per cent; at 3 years, 37 per cent; D at 3 years, 21 per cent

and R at 4 years, 30 per cent. Of the 50 sentences of L at 5 years, 40 per cent were incomplete, with N, 34 per cent.

The smallest known vocabulary with which the 3 to 4 word sentence is associated is that of Moore's son of 475 words, while the largest is R's of 1135 words. As R exhibited such an atypical history of speech development, this relationship may be exceptional with her, *i.e.*, she added words to her vocabulary faster than she developed the ability to use them properly. It may be that a more usual upper limit of size of vocabulary associated with this type of sentence is denoted by H's and D's vocabularies at three years—804 to 856 words; however, some children probably have smaller vocabularies still.

As to the character of the vocabulary correlated with the short sentence, the "stable ratio" in regard to the proportions of the parts of speech seems to have been reached, *i.e.*, when nouns comprise from 50 to 60 per cent of the words, and verbs from 20 to 24 per cent (the vocabularies having been recorded without regular inflections of verbs). This stable ratio is remarkably uniform with children—English-speaking, French and German¹—after they have acquired a certain size of vocabulary—usually between 400 and 600 words, but sometimes less and occasionally more. (Almost without exception the small vocabulary of the baby not well advanced in speech shows a very high proportion of nouns and a small quota of verbs) That these proportions once attained remain about the same is shown in all cases where vocabularies of the same child have been taken on succeeding years beginning with or later than his third birthday.²

My evidence for the coincidence of the attainment of the short sentence and the stable ratio of the vocabulary is based on the records of my daughters D, R and H. This was true also of Moore's son at two years. In no other case are both sets of data available.

To sum up then, the main characteristic of the short sentence stage is the fact that the child is not inflecting his verbs and that he is omitting less essential words. The short sentence exhibits an excess of nouns, and a lack of articles, auxiliary and copulative verbs, preposi-

¹ This ratio is shown in the four examples of vocabularies of French children from 33 months to 7 years of age given by Descoedres (1921:195), in those of a French and a German girl of two years cited by the Sterns (1907.61-62) and in all the vocabularies of the Scupin's son—a German boy—from 2 to 6 years.

² The vocabularies of Boyd's (1914) and Brandenburg's (1915, 1916) daughters and of my daughter D were recorded at 3 and 4 years, of Pelsma's daughter at 2, 3 and 4 years, of the Rowe's son at 4 and 6, of my daughter E at 3, 4, 5 and 6, and of the Scupin's son at 2, 3, 4, 5 and 6.

tions and conjunctions. From 20 to 60 per cent of these sentences are incomplete. As to the child's vocabulary at this stage it probably contains from 400 to 800 or 1000 words, 50 to 60 per cent of which are nouns and 20 to 24 per cent verbs.

THE TRANSITION STAGE

There is, of course, a transition stage between the short and complete sentence, but it must be of short duration for I never happened to record it with any of my children, while I have countless examples of the other stages. I have been able to find only three instances of what seemed to be a transition stage; in each of these the average number of words was five. No details are given as to the character of the talk of Trettien's daughter at the age of $2\frac{1}{2}$. In the 50 sentences of the Miller's son at 26 months, all words are properly inflected and only one sentence is incomplete ("are" was omitted). Perhaps the reason that this child's sentences were shorter than the typical complete sentence was that, on account of his being so very young, his ideas were still simple enough to be adequately expressed in less than 6 to 7 words.

The last case is that of my niece A, at $6\frac{3}{4}$ years, who, although of normal intelligence and in the Second Grade at school was greatly retarded in her speech. At this time she had not mastered inflections, and 32 per cent of her sentences were incomplete. Thus we have two very different pictures in these five-word sentences—one of a precocious and the other of a retarded child. It may well be that neither of these children presented a good example of an average transition stage.

THE COMPLETE SENTENCE

The complete sentence of 6 to 8 words is characteristic of the speech of the more advanced children of three years of age. The earliest date for the attainment of this stage that I happen to have is 33 months (my eldest daughter E), but it doubtless appears earlier with precocious children. All the series of sentences of children with normal speech development from four years on, show about the same sentence length. Even in the case of an adult's conversation (partly with children and partly with other adults) the average of 144 sentences was 8 words.

The attainment of this length of sentence—as the *average* of a series, not the exception—means that inflections have been practically mastered, and that the majority, if not all of the sentences are complete. D and H completed their mastery of inflections at the age of $3\frac{1}{2}$ and at the same time their sentences showed this average length, whereas six months before the average had been from 3 to 4 words. The same thing was true of R at $4\frac{1}{2}$. Of course inflections themselves add little to the sentence length—in fact the added “wills” and “woulds” hardly make up for the lost “dids”—but their attainment seems to be fairly simultaneous with the consistent use of minor words formerly omitted, *v.e.*, if a child has reached the point of saying “comes” and “ate” he will not as a rule omit “is” and “I,” “the” and “a.” Besides this the greater complexity of the sentences now used makes for increased length. A comparison of the proportions of compound and complex sentences in short and complete sentences has already been made.

As to completeness, in a child who had just attained this stage—A at 7 years—23 of the 100 sentences averaging 6 words were incomplete. Kirkpatrick's daughter's 100 sentences at 46 months averaging 7 words also showed 23 incomplete, in 9 of which the subject was omitted and 14 the assertive verb. These cases would seem to be rather exceptional, however. Every one of the hundred sentences of my daughter E at 33 months was complete.

The smallest known vocabulary with which the 6 to 8 word average sentence is associated is about 1000 words—that of E at three. D and H must have had about the same number of words when they attained it.

The complete sentence stage, then, is characteristic of the child who has practically reached the level of simple adult speech; many children of three years have attained it and most have by four years. It is associated with the mastery of inflections and as far as we know at present by a size of vocabulary of 1000 words. Further data will probably lower this figure, that is, some children with vocabularies of 600 to 700 words may have attained the complete sentence, although we know that three children were still in the short sentence stage when possessing vocabularies of 800 to 1100 words.

SENTENCE LENGTH WITH FRENCH AND GERMAN CHILDREN

A few instances of average length of sentence of children of other nationalities are available. Descoedres (1921:195) cites a 33-month

old French boy with a vocabulary of 639 words whose sample sentences show that he was in the short sentence stage. Fifty-seven consecutive sentences of a six-year-old French boy reported by Piaget (1923: 310-315) average 7.3 words. As for German children, the Sterns (1907: 61-62) give 40 sentences of their three-year-old daughter and these average 7 words; Schlag collected 11,270 sentences of a four-year-old girl which averaged 4.6 words, while the 12,078 sentences of a class of eight-year-old children averaged 7 words. Thus it would appear that the short sentence and complete sentence stages occur with French and German children as well as with those speaking English.

EXAMPLES OF DIFFERENT STAGES

Early Sentences: H at 23 Months.—Diddie (lizard) way, way, way. Hocky (fox). Hooley (shoe). Daddy, look. Hingie, birdie, hingie (bird sits on my finger).

Short Sentences: H at 3 Years.—I not a bird. I tiny little baby. I date (great) big tild. I bigger Howard.

N at 5 Years.—I up a 'ee (tree). Bear 'an't get me. It gettin' dark? I 'ink 'o (think so). I did ha' two bir'day 'ake.

Complete Sentences: E at 33 Months.—Who is makin' dat little noise? Dere's a button dat's comin to see dem. Dat one is a kind of funny little dish, Mamma. I guess faiwies will eat out of dat dish.

D at 3½ Years.—If a house is on fire, put water on it. Then it will not make holes in it. And you can live in it forever.

SOME CONCLUSIONS

The whole matter of the development of the sentence has been much neglected by American and English observers. We need data on the first appearance of the negative sentence, the first question, and the different kinds of questions—the whats, wheres, whens, hows and whys. Also the first use of compound and complex sentences should be noted. An excellent method of studying a child's speech development would be the recording of a half hour's or hour's conversation each month until the complete sentence was thoroughly established.

Collecting the vocabulary of any but a very young child is a laborious process; it means constant attendance on the child for three or four weeks and after that a great amount of work to assemble the results. The determination of a child's status in regard to his skill in

the use of the sentence is, on the contrary, simplicity itself—merely recording a series of 30 to 50 or more consecutive sentences and the necessary arithmetical computation. Let me emphasize that it is the *average* length of a series of sentences with which we are concerned (preferably ordinary conversation) and not the exceptional sentence. Moreover, although as few as 30 such sentences ought to show clearly a child's stage of speech development, for any comparative or detailed study there should be at least 100 sentences and preferably more. This average sentence length may well prove to be the most important single criterion for judging a child's progress in the attainment of adult language.

REFERENCES

- Boyd, Wm.: The Beginnings of Syntactical Speech. *Child-study*, Vol. VI, 1913, pp. 21-24, 47-51.
- . The Development of a Child's Vocabulary. *Ped. Sem.*, Vol. XXI, 1914, pp. 95-124
- Brandenburg, G. C.: The Language of a Three-year-old Child. *Ped. Sem.*, Vol. XXII, 1915, pp. 89-120.
- and J.: Language Development during the Fourth Year. *Ped. Sem.*, Vol. XXIII, 1916, pp. 14-29.
- : Language Development during the Fourth Year. The Conversation. *Ped Sem*, Vol. XXVI, 1919, pp. 27-40.
- Descœudres, A. "Le Développement de l'Enfant de Deux à Sept Ans." Neuchâtel, Delachaux, 1921, pp. 327.
- Kirkpatrick, E. A. "Fundamentals of Child Study." N. Y., Macmillan, 1910, pp. 384.
- Miller, G. F. and M. D. and Nice, M. M.: A Boy's Vocabulary at Eighteen Months. *Proceedings Oklahoma Academy Science*, Vol. III, 1923, pp. 140-144.
- Moore, K. C.: The Mental Development of a Child. *Psychology Review Monograph Supplement*, Vol. I, 1896, pp. 1-150.
- Nice, M. M.: The Speech Development of a Child from Eighteen Months to Six Years. *Ped. Sem.*, Vol. XXIV, 1917, pp. 204-243.
- : Concerning All Day Conversations. *Ped. Sem.*, Vol. XXVII, 1920, pp. 166-177.
- : A Child Who Would Not Talk. *Ped. Sem.*, Vol. XXXII, 1925, pp. 105-143.
- Pelsma, J.: A Child's Vocabulary and Its Development. *Ped. Sem.*, Vol. XVII, 1910, pp. 328-369.
- Piaget, J.: "Le Langage et la Pensée chez l'Enfant." Neuchâtel, Delachaux, 1923, pp. 315.
- Rowe, E. C & H. N. The Vocabulary of a Child at Four and Six Years of Age. *Ped. Sem.* Vol. X, 1913. pp. 187-208.
- Schlag, J. Grundsätzliches zu einem Häufigkeitwörterbuche der Kindersprache. *Ztschft. Pad. Psych*, Vol XVIII, 1917, pp 216-226.

- Scupin, E. and G. "Bubi's erste Kindheit." Leipzig, Grieben, 1907, pp. 264.
———: "Bubi im viertem bis sechsten Lebensjahre." Leipzig, Grieben, 1910,
pp. 272.
- Stern, C. and W.: Die Kindersprache. Leipzig, Barth., 1907, 2nd Ed., 1920,
pp. 430.
- Trettien, A. W.: Psychology of the Language Interest of Children. *Ped. Sem.*,
Vol. XI, 1904, pp. 113-177.