

THE PHYSIOLOGICAL BASIS OF LINGUISTIC DEVELOPMENT AND OF THE ONTOGENY OF MEANING. PART II

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IV. THE ACQUISITION OF LANGUAGE

Section I. Learning to Understand Words

A child's understanding of language does not begin with his recognition of words as grammatical units. He reacts rather to the spoken sentence as a whole and the situation in which it is spoken. Jespersen observes that "If the child learns the feat of lifting its arms when it is asked 'How big is the boy?' it is not to be supposed that the single words of the sentence are understood, or that the child has any conception of size; he only knows that when this series of sounds is said he is admired if he lifts his arms up; and so the sentence as a whole has the effect of a word of command. A dog has the same degree of understanding."¹

The child regularly, though only vaguely, understands words before he can pronounce them. Preyer mentions a child 18 weeks old who on hearing 'tick-tack' spoken would look over at the clock; and this was long before he could say 'tick-tack' himself.² Romanes,³ Major,⁴ Bean,⁵ and many others have reported similar cases. Charles Darwin relates of his little son, that "Before he was a year old, he understood . . . several words and short sentences. He understood one word, namely his nurse's name, exactly five months before he invented his first word *mum*; and this is what

¹ O. Jespersen, *Language, its nature, development, and origin*, 1921, p. 113.

² W. Preyer, *The mind of the child*, Part II, p. 69.

³ G. J. Romanes, *Mental evolution in man*, 1893, p. 126.

⁴ D. R. Major, *First steps in mental growth*, 1906, p. 290.

⁵ C. H. Bean, *An unusual opportunity to investigate the psychology of language*, *J. Genet. Psychol.*, 1932, 40, 188.

might have been expected, as we know that the lower animals easily learn to understand spoken words.”⁶ Like Jespersen and Darwin, Preyer,⁷ Kellogg,⁸ and others have noted the familiar observation that dogs, horses and other domesticated animals often learn to understand words.

A child learns to understand some words, specially concrete nouns, because, as Jespersen says, “when the word is used, the object is at the same time pointed at.”⁹ If the home tabby is pointed out or placed in a child’s arms and at the same time, *i.e.* while the child’s motor exploration is going on, the sound stimulus ‘cat’ is given to the child’s ear, the word will necessarily find outlet into the motor paths that will re-create the contours of the tabby. And of course the process is independent of a child’s, or an animal’s, being able or not able to articulate the word. Children’s picture-books convey instruction in a similar way.

The child’s acquisition of meanings of verbs is not much more difficult, for actions and processes can be readily pointed out to a child and the corresponding verb simultaneously spoken. But the process is more complicated for general and for abstract terms, and we shall not go into all the aspects of it. The process of learning word-meanings is never completed even in the adult, who continues to learn what words do or ‘ought to’ mean. It is, indeed, the very process by which linguistic meanings themselves evolve. To discuss this whole process would be to go into the psychology of discrimination and analysis, and much else. The physiological method which we have adopted, seems by no means inadequate to this task, as several of our later sections may indicate.

We wish next to show, quoting at length, and with his permission, from an unpublished paper by E. B. Holt, how the child’s meanings develop greater precision along two lines, namely, towards more adequate connotation and towards more restricted denotation. As follows:—

⁶ C. Darwin, A biographical sketch of an infant, *Mind*, 1877, 2, 294.

⁷ W. Preyer, *op. cit.*, p. 68.

⁸ W. N. Kellogg, Humanizing the ape, *PSYCHOL. REV.*, 1931, 38, 169.

⁹ O. Jespersen, *op. cit.*, p. 126.

It has been repeatedly observed that when a child first learns to call his papa by that name, he will call *any other man* 'papa'. This has been termed an early case of 'generalization'. But let us notice also that, for a few days or weeks, all of the child's other responses are likewise quite the same to any other man as to his own father. The little one is 'not afraid of strange men' for the reason that he is *not as yet aware of any difference* between his father and them. Clearly his word 'papa' denotes (for him) far too many men; and it connotes less, much less, than it should.

Precisely here it is that the physiological interpretation of consciousness departs from the traditional psychology, and leaves that psychology, as it seems to me, at a disadvantage. For the traditional view, committed as it is to the doctrine of 'sensationalism' declares that the adequate stimulation of sense-organs produces 'sensations' in consciousness. The physiological interpretation, on the contrary, asserts that the adequate stimulation of sense-organs produces no consciousness whatsoever unless that stimulation excites muscular response:—re-creation.

The evidence is, in the case cited, that papa or any other man, as stimulus, excites the same responses (including the word 'papa') in the child. The word 'papa', therefore, means for the child no more (means in fact much less) than all men, as stimuli, have in common. The child may be re-creating, as distinguishing 'mamma' from 'papa', only mamma's one skirt and papa's (or any man's) two trouser-legs.

If the father frequently visits the nursery, the normal exploratory reactions of the infant will soon re-create, *i.e.* put into the young consciousness, features of the father which cannot be re-created when any other man is the stimulus; that is, features which would differentiate 'papa' from all other men. In this way the child becomes more fully and adequately conscious of that object, his father.

We must now look more narrowly at the above statement, that any man as stimulus excites the response 'papa'. Does the man as stimulus excite the response 'papa' directly? Is it the difference between mamma and papa as stimuli which determines directly whether the child shall respond 'mamma' or 'papa'? Without attempting to give a final answer to this question, we may cite introspective evidence to show that in many, perhaps in most, cases the answer is *no*. To judge from introspection, we do not name an object until *after* we have perceived it. If a chair on which

one is sitting collapses, it is not unusual to find that one has leaped out of the chair *before* one is conscious that the chair has collapsed. Or if, inadvertently, one has put the lighted end of a cigar into one's mouth, one is apt to be conscious first of holding the cigar off at arm's length and only later to taste ashes and feel pain in one's mouth. But the function of naming, like that of counting, seems to be of a different order: in some cases, at least, we seem unable to name, or to count, anything which we have not *already* perceived.

It would therefore seem that it is the child's perception (motor re-creation) of his mother's skirt which determines his saying 'mamma'; and his perception of his father's, or any other man's, two legs which sets off the response 'papa'. Now a motor act of re-creation is just as much a stimulus in the child's nervous system, as the physical presence of his mother or father can ever be, because the contraction of any muscle stimulates sense-organs (proprioceptors) in the muscle, which then send afferent (sensory) impulses back to the child's central nervous system. And the afferent pattern made up by these proprioceptive return impulses will differ as specifically from any other such afferent pattern, as the muscular act of re-creation which excites these impulses differs from another such muscular act of re-creation. So, if a child on *seeing* his mother speaks the word 'mamma', and on *seeing* his father says 'papa', it is because the proprioceptive return impulses from his motor re-creation of his mother's contours (perchance those of her skirt, merely) have become conditioned to his motor paths which say the word 'mamma', while a different proprioceptive return pattern (from exploring the contours of his father's two legs) has been conditioned to the motor paths which say 'papa'. Such conditioning will inevitably take place, since it is mostly when a person is present before him that he explores that person's contours and simultaneously hears that person's name; and hearing a name has very early been conditioned to speaking it. The part played by proprioceptive return currents in initiating new motor performances was described by William James in connection with the 'concatenation' of activities.¹⁰

Returning now to our question as to how the word 'papa' gradually acquires in the child's consciousness a more adequate connotation, or meaning, we find the answer at hand. The normal exploratory responses of the child will cause him to see his father more completely, and the father's dealings with the child will

¹⁰ W. James, *The principles of psychology*, 1890, 1, 115-118.

develop further responsive habits (affectionate, playful, etc.) in the child. All of these, the growing 'father complex', besides being (by simultaneity) rather promiscuously conditioned to one another, will also (by simultaneity) be generally conditioned to speaking the word 'papa'; and this latter, in turn will be rather generally conditioned to these activities. Thus the word 'papa' acquires for the child an ever widening connotation, or meaning. It stimulates the child to ever more extensive and more diversified motor attitudes.

Step by step with this process the denotation of the word, 'papa', for the child, will become narrower. In the presence of a different man as stimulus, the child will also proceed to explore; and will infallibly run through those habits of exploration which he has learned on his father as stimulus. In so far as this other man is like the father, this 'perceiving his father *in* the stranger' will run smoothly, and the child will not perceive a difference. But the better the child knows his 'papa', the sooner will come the moment when this re-creating of the father will meet an obstacle and be checked. The little one cannot play with papa's beard on another man who has no beard, nor fit the curves of papa's rotundity to a lank figure that leads his eye and hand along straight lines and sharp angles. The proprioceptive return impulses are now, perforce, *not* altogether the same as those which are conditioned to the motor paths which say 'papa'. When the difference is great enough, the child will 'refuse' to say, that is, will not say 'papa'. The denotation of this word 'in the child's mind' has been restricted. Thus week by week as the connotation of the word 'papa' becomes more adequate, its denotation is reduced.

Enough has been said to enable the reader to work out, at his pleasure, the way in which, when a child has been told that 'pussy is a quadruped, doggie and mousie are quadrupeds, ponies, cows, and elephants are all quadrupeds', so many motor re-creations, all simultaneously stimulated by the one word 'quadruped', will in the execution interfere with one another until nothing is left but a blurry skeleton, an *image* not very different from a four-legged deal table with a very shadowy 'head' at one end and a 'tail' at the other. This is, of course, the 'composite photograph' view. And if any reader should hesitate to depart so widely from what David Hume said on the psychology of general ideas, one begs that he will put the matter to the test of introspection.

Section 2. *Two Early Sources of Meaning*

Learning to understand spoken words and learning to speak understandingly are of course closely connected processes. Except on a few elementary points it is not feasible to discuss them separately. In this section we shall consider two ways in which meaning accrues to sounds that were first spontaneously babbled.

The first case consists of spontaneous baby sounds which become words because older persons attach a meaning and themselves adopt the words so created. The mechanism here is the same as that by which an infant learns to cry in order to convey meaning; as was described in Chap. III, Sect. 3. In this way 'emotional cries' have given rise to various words, mostly of the interjectional order, some of which are recognized by lexicographers. Monboddo believed that words of this sort are numerous and important.

It is therefore inarticulate cries only that must have given rise to language; and, . . . it appears at first sight very probable, that language should be nothing but an improvement or refinement upon the natural cries of the animal, more especially as it is evident, that language does no more than enlarge the expression of those natural cries. For such cries are used by all animals who have any use of voice to express their wants; and the fact is, that all the barbarous nations have cries, expressing different things, such as, cries of joy, grief, terror, surprise, and the like. The *war-cry* of the Indians of North America is well known to those that have been among them; and they have a cry, when they return from any expedition, by which they signify, before they enter their village, what success they have had.¹¹

A mother or nurse often takes some babbled sound of the infant to be an effort to designate some object noticed by the infant, and therefore she fetches forward the object:—'Here's your *wu-wu*, dearie!' This practice if often indulged in gives rise to a rather extensive vocabulary of 'baby-talk', a language that is ephemeral and local to one baby's nursery, and that considerably retards the infant's progress in acquiring the

¹¹ Lord Monboddo (James Burnet), *Of the origin and progress of language*, Second edition, 1774, Vol. I, p. 475.

actual parental tongue. But some words which have originated in this way are very far from being either ephemeral or local, and of these the classical examples are the words 'mamma' and 'papa'. As Jespersen has remarked (*cf.* Chap. II), "the labials, *p*, *b*, and *m*, are early sounds if not the earliest"¹² which an infant utters; and of vowels, the 'open' (*o*, *a*) are the earlier. This seems to be true of infants belonging to any race. "I am fully persuaded", wrote de Brosses, "that were a child left entirely to himself without hearing either a human or an animal voice, he would begin his use of language with the syllables Papa and Mama . . . the easiest vowels and consonants because they are essentially those in which the simplest movements of the lips are involved."¹³ Now the mother (or nurse) and father are the persons in closest contact with the new born baby, and they, eager to find that the little one 'recognizes' them, add as 'meaning' of the first babbling—He means me! The result of this egocentric delusion has been remarkable: in almost every known race, ancient or modern, the familiar names for mother, father, and nurse are one or other of the following first sounds, *ma*, *ba*, *pa*, *na*, *da*, *ta*; with the infantile reduplication. Possibly other factors have contributed towards a convergence; in any case 'mamma' is the most widely used name for mother, and 'papa' for father. But, de Brosses states, "The Georgians and Iberians say *Mamao* for father . . . among the inhabitants of the East Indies, the word *mama* signifies man or father."¹⁴ We may add that in Persian Urdu the word *mámá* denotes a nurse or maid-servant; the word *mámú* denotes maternal uncle. In the Panjabi language the word *mámá* denotes the maternal uncle; whereas *mumma* denotes the maternal breast.

The fact that in so many languages the word for mother contains the syllable *ma* and for father the syllable *pa*, has led some philologists to suspect a single remote linguistic source. They may well be called two fundamental roots but,

¹² O. Jespersen, *Language, its nature, development, and origin*, 1921, p. 105.

¹³ C. de Brosses, *Traité de la formation mécanique des langues*, 1765, Vol. I, pp. 233-235.

¹⁴ *Ibid.*, p. 238.

as Jespersen warns us, it is "wrong to use them as evidence for original kinship between different families of language and to count them as loan-words. . . . The English *papa* and *mam(m)a*, and the same words in German and Danish, Italian, etc., are almost always regarded as borrowed from French; but Cauet rightly points out that Nausikaa (Odyssey 6. 57) addresses her father as *pappa fil*, and Homer cannot be suspected of borrowing from French."¹⁵ Words that have originated in any such way as have *mamma* and *papa*, call for great circumspection on the part of philologists. And it is a question how many such words there may be.

De Brosse¹⁶ drew up a long list of 'primitive keys' or 'generic roots', each one of which is a sound (usually a vowel and consonant) which, given the normal human body and vocal apparatus, de Brosse believed is as much bound to have a certain meaning universally attached to it as are the syllables *ma* and *pa* (which are included in his list). For each such root he gives a considerable number of illustrations, drawn from widely separated languages. The sound *ST*, for instance, occurs in many languages in words which signify stability, or some aspect of that idea. In some cases he suggests how these quasi-inevitable connections between sound and meaning may have come about; but on the whole he is more concerned to demonstrate the existence of these connections, than to explain their origin. If these 'roots' appeared to be onomatopoeic sounds, they would present no mystery; but most of them in no way suggest onomatopœia. It seems possible that these connections between sound and meaning may involve, in addition to sound production, inevitable interrelations between organism and environment; in ways roughly analogous to the cases of 'mamma' and 'papa'. Whatever the emotions felt by grammarians or even semeiologists toward de Brosse's 'generic roots', we believe that he has raised a question which, if solved, may have important bearing on the relation between the holophrastic and the root stages in the development of languages. It is

¹⁵ O. Jespersen, *op. cit.*, 159.

¹⁶ *Op. cit.*, Vol. I, pp. 224-288; Vol. II, pp. 194-405.

pleasant to record that tentative studies along cognate lines are being attempted by a few psychologists.¹⁷

The second way in which meaning accrues to merely babbled sounds is the long familiar phenomenon called onomatopœia. W. D. Whitney describes onomatopoetic words as "those in which the attempt had been made in a rude way to imitate the sounds of nature: as when the *cuckoo* and the *pewee* and the *toucan* were named from their notes; or as in some of the descriptive words like *crack* and *crash*, *hiss* and *buzz*, which are by no means all old, but have been made, or shaped over into a pictorial form, within no long time. We call such words *onomatopœias*, literally 'name-makings', because the Greeks did so: they could conceive of no way in which absolutely new language-material should be produced except by such imitation."¹⁸ When the child hears an animal or an object produce a characteristic sound, it tends to reproduce that sound through the mechanism of auditory-vocal reflex-circles (as explained at the end of Chap. II). During the lalling period, reflex-circles are developed such that when the infant hears a sound he at once repeats it as closely as his vocal apparatus permits. After thus exercising his entire gamut of possible vocalizations, whether his mother says *mamma*, a dog says *bow-wow* or *bark*, a wheelbarrow says *creak*, or a waterfall says *roar*—the infant repeats ('imitates') the sound. Such sounds come to 'mean' the objects or processes themselves, and so become 'words', because when the sound is heard the object or process emitting it is near enough to be explored and re-created by the child's sensori-motor organs. Each sound acquires its meaning in a motor negotiation ('experience') with the object that emits it, and the sound will have the same meaning if it is spoken as a 'word'. 'Bow-wow', 'Ding-dong', and 'Yo-heave-ho' are all, we believe, cases of sounds with 'natural meaning'.

Preyer rightly regards 'the onomatopoetic attempts of

¹⁷ E.g. E. M. von Hornbostel, *Laut und Sinn, Sprachwissenschaftliche und andere Studien* (für Karl Meinhof), 1927, pp. 329-348; A. Wellek, *Der Sprachgeist als Doppelpfindler*, *Zsch. f. Aesth. u. allg. Kunstwiss.*, 1931, 25, 226-262.

¹⁸ W. D. Whitney, *The life and growth of language*, 1875, p. 120.

children as simply a sort of imitation'.¹⁹ Such imitation of animal cries and natural sounds (such as thunder) is of course inexact, and varies from child to child. It is not surprising that onomatopoeic names for the same object are slightly different in different languages:

Thus to English *cockadoodledoo* corresponds French *coquerico*, German *Kikeriki*, and Danish *kykeliky*, to E. *quack-quack*, F. *cancan*, Dan. *raprap*, etc.²⁰

To this list we may add the Panjabi *Kukroon-ghoon* and *ghan-ghan* as characteristic onomatopoeic words for rooster and duck respectively. Conforming to current superstition, Ernest Weekley suggests that 'ancestry' may account for the individual variations in each child's onomatopœia:

The exact form might be conditioned by his ancestry, for it is a curious fact that babies of different nationalities interpret animal cries variously. The *cock-a-doodle-doo* of the English chanticleer is to a French ear *cocorico*, to a German *Kikeriki*. That the more clearly defined note of the cat offers fewer opportunities for variation is evident from the fact that the Chinese for cat is *miau*, a form, by the way, much more acoustically accurate than our conventional, literary *mew*. The feline murmur of pleasure is less easily represented by spelling, and there is a wide difference between our *purr* and the equally expressive French *ronron*.²¹

In view of what we know about the reflex-circle, we feel that no ancestry is in question; unless, indeed, the ancestry of the chanticleer and the cat.

Section 3. *The 'Little Language', and on Interpreting It.*

In the lalling period the infant practices its 'primordial babblings' until its elders almost come to consider it a little engine of torment. Yet it needs to practice these sounds well, for they comprise nearly all the sounds that it will later use.²² As it grows on to childhood it is incessantly active,

¹⁹ W. Preyer, *The mind of the child*, Part II, p. 100.

²⁰ O. Jespersen, *Language, its nature, development, and origin*, 1921, p. 150.

²¹ E. Weekley, *Adjectives—and other words*, 1930, p. 84.

²² Cf. W. Stern, *Psychology of early childhood*, 1924, p. 145; M. M. Nice, *A child's attainment of the sentence*, *J. Genet. Psychol.*, 1933, 42, 219.

new reflex conditionings (which no outsider can keep account of) are steadily going on, and soon its behaviour, vocal and other, baffles the comprehension of grown-ups. It makes earnest but often incomprehensible vocal appeals to its elders, and in fact acquires a strange 'little language' of its own. As Jespersen says:

The 'little language' which the child makes for itself by imperfect imitation of the sounds of its elders seems so arbitrary that it may well be compared to the child's first rude drawings of men and animals. A Danish boy named Gustav (1.6) called himself [dodado] and turned the name *Karoline* into [nnn]. Other Danish children made *skemmal* into [gramn] or [gap], *elefant* into [vat], *Karen* into [Gaja], etc. A few examples from English children: Hilary M. (1.6) called Ireland (her sister) [ani], Gordon M. (1.10) called Millicent (his sister) [dadu]. Tony E. (1.11) called his playmate Sheila [dubabud].²³

The child's imitation of its elders is by no means the only factor contributing to the little language, as is shown by the fact that children of about the same age growing up together, especially if they are left a great deal by themselves, often develop an astonishing jargon of their own which can hardly be called any longer a 'little' language. Twins are very apt to do this. Jespersen records a case of twin boys about five and a half years old, who had been left very much to shift for themselves. "When they were by themselves they conversed pretty freely and in a completely unintelligible gibberish, as I had the opportunity to convince myself when standing behind a door one day when they thought they were not observed."²⁴ Such children are found to be somewhat handicapped for learning their normal mother tongue.²⁵

Mispronunciation is of course a feature of the 'little language'. The very young child lisps, and there are other sounds than *s* as well as combinations of sounds, employed in language, which the child finds difficulty in articulating.²⁶

²³ O. Jespersen, *op. cit.*, p. 106. The notation of age, e.g. (1.6), means 'in the seventh month of the second year'.

²⁴ *Ibid.*, pp. 185-186.

²⁵ E. J. Day, The development of language in twins, *Child Development*, 1932, 3, 179-198.

²⁶ O. Jespersen, *op. cit.*, Chap. V, §§ 3-6.

In the case of the writer's son, it was observed that at the age of about two years the sound *gu-gu* was his nearest approximation to the word *mango*. Later on he used the same sound to indicate any kind of fruit. This sound was adopted by the older members of the family in imitation of the child, and remains to this day the family word for any kind of fruit; although the child is now old enough to pronounce almost any word in the English language perfectly.

One is tempted to wonder whether this childish practice of words imperfectly pronounced may have a cumulative (and degrading?) effect, as one generation succeeds another, on the standard adult pronunciation of the language, and even on the forms of words. Some philologists, we believe, have held it responsible for sound changes. But this is a problem for the phonetician, rather than the psychologist.

Another characteristic of the 'little language' and indeed of children's speech (and thought) in general, is that tendency to 'gross generalization', as it has been called, of which we have already seen a case in the infant's naming of any man 'papa' and of any woman 'mamma' (Chap. IV, Sect. 1). At a time when very inept 'explanations' of this phenomenon were being offered, J. M. Baldwin came very close to the actual physiology of the matter:

It is only partially true that the concept arises from the percept at all. It is rather true that the two arise together, by the same mental movement, which is apperception or motor synthesis. . . . He [an infant] reacts to it [a presentation A in consciousness], and so stands ready to react to it again. This readiness is his *expectation*—the only tendency he has to a definite reaction; and as the only one, it stands ready to 'go off' on any kind of stimulus which is locally near enough to discharge that way. Whatever then actually does happen is at first reacted to as A, and remains A, by this active confirmation [re-creation?], if it is possible for the child's consciousness to keep it A.²⁷ . . . It is evident that the 'general' or 'abstract' is not a content at all. It is an attitude, an expectation, a motor tendency.²⁸

²⁷ J. M. Baldwin, *Mental development in the child and the race* (2nd. ed.), 1895, p. 326.

²⁸ *Ibid.*, p. 330.

It would be unjust to imply that Baldwin's theory of the mind was exclusively physiological and motor, but his pointing to motor pathways previously organized and now liable to be set off by a range of stimuli beyond those to which the particular response is specific, was a long step forward. It is not merely the 'gross generalizations' of children that are to be explained in this way, but many profoundly important phenomena of the adult mind—'stereotypes', which are the often equally gross generalizations of men and women, magic and other forms of superstition, fictions or the 'as-if' notions, and so on. So far as the generalizations of children go, we have sufficiently described the physiological process involved, in Sect. 1 of this Chapter.

The interpretation of children's early linguistic efforts is difficult. And in studies of infantile linguistics the mistake has often been made of reporting sounds and listing the words used by a little child without observing *at the same time* the whole behaviour of the child in the concrete situation which evoked these verbal responses. What a child means by a word is revealed only by what he is doing when he speaks the word.

The same is true of the sounds made by animals. Wallace Craig, in his extraordinarily instructive studies of the behaviour of pigeons, has shown that the sounds made by a pigeon become significant only when studied in connection with the pigeon's simultaneous 'bowing, strutting, bristling of feathers', etc.²⁹ And it may be questioned whether the scientific study of languages has not suffered by too exclusive attention to written words and word-sounds, apart from their *reference*; that is, apart from the concrete situations in which they were used and the concrete behaviour of the persons who used them. As W. L. Graff has remarked:

Especially historical linguists, with their dependence upon written documents and their desire for tangible and clear-cut data, are liable to study sounds instead of words. Etymologizing is only too often nothing but an application of phonetic laws or formulæ.

²⁹ W. Craig, The voices of pigeons regarded as a means of social control, *Amer. J. Sociol.*, 1918, 24, 88.

It is forgotten that such work is mere pioneer work, destined to clear the way for more comprehensive solutions. That is why many historical phonetic studies are so dead and devoid of human interest. . . . Is it to be wondered at that linguist and psychologist are so often at variance? ³⁰

Anyone who studies the speech of children is prone to impute to the child the same 'meaning' which the word or sound uttered by the child has for the observer himself. This is the fallacy of enelicomorphism. But in this way the student will be almost invariably misled. M. W. Humphreys writes of a little girl 18 months old:

Until her eighteenth month she employed 'No' for both Yes and No, and then she substituted 'Mam' (from Yes, Mam) for 'No' in the sense of Yes, and retained it till she was two years old, using 'Yes' only when it was specially suggested to her.³¹

The infant's mere lalling of 'ma-ma-ma-' has not a vestige of meaning for the infant, and yet, as we have seen, the mothers of the world from prehistoric times have supposed themselves to be by this sound recognized and called by name.

In order to find out what denotation and connotation a child's use of the word 'mamma' implies, one must find that action, presumably on the part of the mother, which when performed will leave the child satisfied, that is, quiescent and expecting nothing further. It is with expectation, that is with muscles set for some action but that action suspended, that the child calls for 'ma-ma'. And this suspended motor expectancy *is* the meaning, on each occasion, of the child's word. It means that for which he wants his mamma; and this meaning is not in the word but in that situation in which the child's readiness for action waits suspended. Hence, as we have said, one who records only a child's vocalizations will never discover the significance of the child's words. The child calling to his 'ma-ma' is in every way analogous to our previous illustration of the dog that dropped the ball at

³⁰ W. L. Graff, *Language and languages*, 1932, p. 99.

³¹ M. W. Humphreys, A contribution to infantile linguistics, *Trans. Amer. Philol. Assoc.*, 1880, 9, 10.

a stranger's feet and then looked up waiting for the stranger to throw it. So here, if in response to the word 'ma-ma', the breast or the nursing-bottle is proffered and the child's suspended motor set at once goes into action, with no trace of suspense remaining, and irrespective of whether the mother or someone else did this proffering, then we are justified in concluding that the child meant only 'milk' and no more. The physical, mental, social and other aspects of the mother were entirely absent from this meaning.

This method of interpreting child language is amply confirmed and justified, as it seems to us, by the facts which we shall consider in the following two sections.

Section 4. The Action-Content of Words; the Holophrase

Practically all of the words used by children have a decided 'action content', some concrete objective reference, and above all a reference to the child himself. That the young child has few, if any, abstract words, has been demonstrated by W. E. Bohn,³² W. Boyd,³³ J. Drever,³⁴ and M. M. Nice.³⁵ Chamberlain,³⁶ Tracy,³⁷ Dewey,³⁸ Binet³⁹ and others have shown that a child's words refer to his own behaviour as well as to that of others.

The child's earliest words are not the grammarian's 'parts of speech', but word-sentences. This fact has been ignored by some observers, who have gathered data to show the percentage of 'nouns' etc., in an infant's early vocabulary; whereas the words of little children, whatever they may sound like, do not function as nouns, verbs, or other parts of speech. Careful observation of child behaviour has shown that the child's so-called 'nouns' or 'verbs' are actually holophrases, that is, are in fact sentences. J. F. Markey states that

³² W. E. Bohn, First steps in verbal expression, *Ped. Sem.*, 1914, 21, 578-595.

³³ W. Boyd, The development of a child's vocabulary, *Ped. Sem.*, 1914, 21, 95-124.

³⁴ J. Drever, A study of children's vocabulary, *J. Exper. Ped.*, 1915, 3, 182-189.

³⁵ M. M. Nice, Speech development of a child from eighteen months to six years, *Ped. Sem.*, 1917, 24, 204-224.

³⁶ A. F. and J. C. Chamberlain, Studies of a child, *Ped. Sem.*, 1909, 16, 62-103.

³⁷ F. Tracy, The psychology of childhood, 1909, p. 150.

³⁸ J. Dewey, The psychology of infant language, *Psychol. Rev.*, 1894, 1, 63-66.

³⁹ A. Binet, Perceptions d'enfant, *Rev. Phil.*, 1890, 30, 582-611.

“there is also practically universal agreement upon the fact that the first symbols of the child are in reality word-sentences designating action and subject or object, or all three at once”;⁴⁰ and that “the classification of a child’s vocabulary upon the basis of the adult parts of speech is a highly arbitrary and fictitious process. These first so-called nouns, as Dewey (1894) and others have pointed out, are in reality verbal-adjectival-nominal or nominal-adjectival-verbal symbols, and the like. In short, they are action words and word-sentences, as we have seen, and are often accompanied by the appropriate action on the part of the child.”⁴¹ H. Lukens emphasizes the same point: “To classify such child-words by the adult distinctions of the parts of speech . . . is of course to be misled by very superficial considerations. It does not seem possible to classify a child’s words until he uses all of the parts of speech.”⁴² Sully also observed that the first words of a child are as a rule whole-sentence words.⁴³ Charles W. Waddle says that “a single word conveys a variety of meanings, depending upon intonation, inflection, accompanying gestures, facial expression, pantomime, and similar factors. The pronoun ‘me’ often performs the function of such sentences as ‘take me up’, ‘I want to ride’, ‘give me the book’, ‘let me go with you’; the preposition ‘up’ may mean at one time, ‘I want you to give me my ball’, or again, ‘I want you to put me up in my chair’.”⁴⁴

In connection with the theory of ‘recapitulation’ as also with the general theory of language development, it is interesting to note that the holophrastic use of sounds is found not only in children, but also among primitive men and in primitive languages. This fact was discovered by Europeans early in the eighteenth century, if not indeed much earlier, and has still, we believe, not received its due recognition in linguistic science. Lord Monboddo, writing in 1774, de-

⁴⁰ J. F. Markey, *The symbolic process*, 1928, p. 50.

⁴¹ *Ibid.*, p. 54.

⁴² H. Lukens, Preliminary report on the learning of language, *Ped. Sem.*, 1894, 3, 424-460.

⁴³ J. Sully, *Studies of childhood*, 1895, p. 171.

⁴⁴ C. W. Waddle, *An introduction to child psychology*, 1918, pp. 166-167.

scribed the languages of some of the North American Indians as follows:

With respect to syntax, they appear to have none at all; for they have not prepositions or conjunctions. . . . In short, they have not, so far as I can discover, any way of connecting together the words of their discourse. Nor is this a peculiarity in their language; but it is the same in the languages of the Galibi and Caribs, Those savages, therefore, tho' they have invented words, use them as our children do when they begin to speak, without connecting them together; from which we may infer, that syntax, which completes the work of language, comes last in the order of invention, and perhaps is the most difficult part of language. It would seem, however, that persons may make themselves understood without syntax. This I think can be done no other way but by the arrangement of words (which is a considerable part of the syntax in modern languages that have not cases), by accents or tones, or by gestures and signs. The Hurons, and I believe all the barbarous nations, have a great variety of tones; they have also much action in their speaking; and there can be no doubt but that the position of the word will commonly determine what other word in the sentence it is connected with.⁴⁵

Monboddo gives the following instances of holophrastic words from the languages of these Indians:

. . . they have a great many words, which are so many sentences. Thus, they express by one word, *There is water in the bucket*; by another word, quite different, *There is a great deal of water*; by a third, different from either, *You have overturned the water in the fire*. But by one and the same word they express, *Thou shalt be very glad of it*, and *Thou art very glad of it*. Their verbs commonly express the action with the subject [= object] of the action; and but very few denote the action simply by itself. Thus, there is no word which signifies simply to *cut*, but many that denote *cutting fish*, *cutting wood*, *cutting cloaths*, *cutting the head*, *the arm*, etc. In like manner, they have no word that denotes the simple idea of *giving*; but there are two or three pages in our author's [G. Sagard's] dictionary filled with words signifying to *give* different things. This again multiplies their words so much, that, if it were not for the reason above mentioned [*i.e.* p. 533, "if their sphere of life were not

⁴⁵ Lord Monboddo, *Of the origin and progress of language*, 1774, vol. I, pp. 537-538.

very narrow”], their language could not serve the ordinary purposes of life.⁴⁶

The sphere of life of primitive men may be relatively narrow, yet they have their enterprises and responsibilities, and their cumbersome holophrastic vocabularies contain a prodigious number of words. The holophrastic efforts of little children belong to a still more primitive phase, and here we are able to observe in all clearness a phenomenon which is present but less conspicuous among savages, and not quite extinct even in the most polite conversation: that a word with many meanings depends on intonation and gesture to make the intended meaning explicit. These latter are functionally a part of the word. Clearly this phenomenon is a vestige of the ‘whole-body language’ mentioned in Chap. III, Sect. 3. Preyer observes that “it is of the greatest importance for the understanding of the first stage of the use of words in their real significance, after the acquirement of them has once begun, to observe how many different ideas the child announces by one and the same verbal expression. Here are some examples: Tuhl (for Stuhl, chair) signifies—1. ‘My chair is gone’; 2. ‘The chair is broken’; 3. ‘I want to be lifted into the chair’; 4. ‘Here is a chair’.”⁴⁷

The physiological explanation of holophrastic words is simple. Any sound that a person can make (whether he speaks, whistles, snaps his fingers, or rings a bell) can be conditioned in himself and in others to any amount of action. That sound is then a holophrastic signal, or symbol. If it is a spoken sound, it is called a holophrastic word, or holophrase. It is by *analysis* of the activity which the symbol excites that we arrive at the various ‘parts of speech’ and their syntactic order, that is, the sentence. This analysis of human action, if we consider it attentively, can never be carried to completion: any word whatsoever remains to some extent a holophrase. And the majority of words, in every language, remain grossly holophrastic.

⁴⁶ *Ibid.*, pp. 534-535.

⁴⁷ W. Preyer, *The mind of the child*, Part II, pp. 95-96.

Section 5. *The Child's Speech is Egocentric*

As every reflective mother well knows, the behaviour, speech, and thought of a child are egocentric: they all center round his own needs and impulses. From the physiological point of view, this self-centeredness is to be expected; and recent observations on children well illustrate it. Of these, probably none are more illuminating than the well-planned and careful observations of Jean Piaget and his associates, made at the *Maison des Petits* in Geneva.

For a period of about one month, the words and all accompanying action of several children were very minutely and *intelligently* observed, and carefully recorded. The records show, among other things, that even when a child was apparently addressing another child, he was as a matter of fact talking to himself, and seldom if ever even paused for an answer. This kind of talk Piaget calls 'collective monologue', a variety of egocentric speech. After a simple mechanical device had been explained to one child, he was asked to explain the mechanism to another child. The explanation and the demeanour of both children were carefully watched and recorded. The first child behaved as if he were explaining the mechanism to himself, and paid no thought to making himself understood by the other. In the words of Piaget, "the child of 6 to 7 still talks to a great extent for himself alone, without trying to gain the attention of his hearer."⁴⁸ Such naively egocentric speech drops off markedly at about the seventh year. But Piaget has shown that grossly egocentric thought and speech predominate in the early years of the child.

The researches of Piaget have been abundantly confirmed by other investigators. M. E. Smith, who has collected data on the conversation of hundreds of children, writes:

In looking over the conversations collected it is evident that, in the strictest use of the word, very little of the younger children's talk is conversation. It rather approaches monologue, being a running commentary on the child's own actions, as in the case of Boy 30, aged two years, eleven months: 'I am making cake. . . .

⁴⁸ J. Piaget, *The language and thought of the child*, 1926, p. 100.

I'm going. No, I got. I got. My finger can get in. Just fell. I make something out of sand. Some splashed out', or, as an expression of his desires, when the same child goes on, 'Let me pat. I want some more blocks. Can I have that track? Won't go. That's enough. I want some. I want some more. I want vinegar jar'.⁴⁹

Several other studies have been stimulated by Piaget's researches. In the year 1929, Rugg, Krueger, and Sondergaard studied the conversations of kindergarten children. Out of the three thousand remarks recorded, about 40 percent revealed not self-centeredness but self-assertiveness, while a negligible percentage of .25 contained ideas of self-depreciation. These observations confirm Piaget's view that a kindergarten child is eminently egocentric.⁵⁰ Vygotsky and Luria also confirm Piaget as to the egocentric character of child language. They assert, moreover, that egocentric speech does not really disappear at maturity: such part of it as is driven under cover (and not all of it is, by any means) continues as internal speech, which serves the same purpose.⁵¹

Section 6. The Sentence-Building Activity of the Child

Clare and William Stern have drawn the following distinction between a word and a sentence: "The speech units of the child belong to no single word-class, since they are not single words but sentences. For a word is the expression for a unitary content of consciousness; a sentence, on the contrary, is the expression for a unitary (completed or to be completed) attitude with regard to the content of consciousness."⁵² The holophrastic use of words appears to be the child's first effort at making a sentence. But the holophrastic use of words must not be confounded with true syntactic activity, which involves the integration of words in a definite and

⁴⁹ M. E. Smith, An investigation of the development of the sentence, etc., *Univ. of Iowa Studies: Studies in Child Welfare*, 1926, Vol. III, No. 5, p. 21.

⁵⁰ H. Rugg, L. Krueger, and A. Sondergaard, Studies in child personality: I. A study of the language of kindergarten children, *J. Educ. Psychol.*, 1929, 20, 1-18.

⁵¹ L. S. Vygotsky, and A. R. Luria, The function and fate of egocentric speech, *Ninth Internat. Cong. Psychol., Proceedings and Papers*, 1929, publ. 1930, pp. 464-465.

⁵² C. and W. Stern, *Die Kindersprache*, 1907, p. 164.

articulate relation. The effort of the human race to invent symbols (words) which will stand for the various moments of experience, and then to combine those symbols (the task of 'syntax') so as at all adequately to represent, and so to communicate, the pattern of experience, has been a mighty enterprise; and it is by no means fully accomplished even yet. But a very intricate system of conventions has grown up, and here, naturally, the child learns his way about only slowly and painfully.

Lord Monboddo might have said of the child the same that he says of the savage in the following paragraph:

Let us take, for example, the verb signifying to *beat*. There is first the action of beating; then the agent or person who beats; then the person or thing which suffers, or is beaten; and, lastly, there is the manner of beating, whether quickly or slowly, severely or gently, etc. But all these exist together in nature; and therefore the savage considers them all in the lump, as it were, without discrimination; and so forms his idea of the action; and according to this idea expresses it in words. Whereas, in languages formed by rule, all those things are expressed by separate words, or by variations of the same word, if that can be conveniently done. Further, there are some necessary adjuncts of the action, such as time. This too, though inseparably joined with it in nature, accurate abstraction separates, and expresses either by a different word, or by a certain variation of the same word: But this the savage likewise throws into the lump, and expresses all by the same word without variation, or by a word quite different. There is also the disposition or affection of the mind of the speaker, with respect to the action affirming or denying it, commanding it, or wishing it. These dispositions, in regular languages, are expressed, either by separate words, or by a variation of the word denoting the action; whereas, in the languages we speak of, they are either not expressed at all, or by a word altogether different. This will produce a further increase of words not necessary: For as there is no word expressing the action simply by itself, if there be the least change in any circumstance of the action; nay, if there be but an alteration in person, number, or time, or in the disposition of the mind of the speaker with respect to the action, there must be a new word. For, as they have no ideas of those circumstances separate from the action, they can have

neither separate words to express them, nor variations of the same word, even if they knew that great secret of artificial languages, I mean inflection.⁵³

The syntactic activity of the infant is a slow and laborious process; and does not proceed far without social cooperation. In the case of little Frans (1.7), reported by Jespersen, the process took the following form. He was accustomed to say a single-word 'vand' whenever he wanted water. One day "his mother said: 'Say please'—and immediately came his 'Bebe vand' . . .—his first attempt to put two words together."⁵⁴ Jespersen goes on to say: "Later—in this formless period—the child puts more and more words together, often in quite haphazard order: 'My go snow' ('I want to go out into the snow'), etc. A Danish child of 2.1 said the Danish words (imperfectly pronounced, of course) corresponding to 'Oh papa lamp mother boom', when his mother had struck his father's lamp with a bang. Another child said 'papa hen corn cap' when he saw his father give corn to the hens out of his cap."⁵⁵

With the further growth of the infant's symbolizing activity, more symbols are strung together in a sort of loose sentence, though the syntactic structure is still rudimentary; as has been described by J. F. Fenton:

In many of my child's first sentences I could see quite clearly that each word came forth as a separate mental act; the sentence did not represent one total idea, thought of all at once, but a series of details, noted and expressed one at a time, as one might point out and name one by one the separate elements of a picture, without first realizing its total significance at all. For instance, the longest sentence of his first eighteen months, uttered soon after seeing his father climb into an automobile with another man and drive away, consisted of the words, 'daddy, school, man, auto'. But the inflection of his words, the pauses between, the thoughtful expression accompanying each word, all pointed to the conclusion that his idea was put together bit by bit, like a mosaic, out of separate short and

⁵³ Lord Monboddoo, *Of the origin and progress of language*, 1774, vol. I, pp. 528-530.

⁵⁴ O. Jespersen, *Language, its nature, development, and origin*, 1921, p. 134.

⁵⁵ *Ibid.*, pp. 134-135.

simple mental acts. It has less the sound of one connected sentence than of four brief exclamations, 'Daddy!' 'Kool!' 'Man!' 'Atto!' ⁵⁶

The age at which such sentence-construction begins, varies with individual children. To quote James Sully:

The age at which it is first observed varies greatly. It seems in most cases to be somewhere about the twenty-first month, yet I find observers among my correspondents giving as dates eighteen and a half and nineteen months; and a friend of mine, a Professor of Literature, tells me that his boy formed simple sentences as early as fifteen months. . . . In the case of one child about the age of twenty-three months most of the sentences were composed of two words, one of which was a word in the imperative. . . . M's first performance in sentence-building (at eighteen and a half months) was, 'Mamma, tie', *i.e.* 'tie gloves'.⁵⁷

Of a case under observation, K. C. Moore writes, that "the first sentence was uttered in the sixty-sixth week. It contained but two words, 'papa gone', and was the product of much previous practice on the part of the child, who had made many trials before he was able to pronounce successively the sounds therein contained".⁵⁸

Sometimes a little child will hear a sentence spoken and will later repeat it merely as a phonetic unit, not at all realizing the distinct meanings of the several component sounds. This, of course, does not indicate progress toward understanding syntax. Another way in which a rudimentary sentence-building is simulated, as Jespersen warns us, is through 'echoism'. As a child repeats any sounds, reflexly or 'imitatively', he will often repeat ('echo') the last couple of words of a sentence which is addressed to him or spoken in his hearing, and these words may sound like a childish sentence. Jespersen gives the following illustrations:

'Shall I carry you?—Frans (1.9): Carry you.
Shall Mother carry Frans?—Carry Frans.
The sky is so blue.—So boo.
I shall take an umbrella.—Take rella.'⁵⁹

⁵⁶ J. F. Fenton, *Practical psychology of babyhood*, 1925, p. 137.

⁵⁷ J. Sully, *Studies of childhood*, 1895, pp. 171-172.

⁵⁸ K. C. Moore, *The development of a child*, *Psychol. Monog.*, 1896, No. 3, p. 131.

⁵⁹ O. Jespersen, *op. cit.*, p. 135.

It is evident that the progress from undifferentiated holophrase to articulated sentence is a progress in becoming specifically conscious of what one means, in analyzing that vague desire which the holophrase sought to express, into successive steps. This corresponds exactly to the general progress of thought, always towards analysis, in both an individual and a society. It also exactly corresponds to that exploration and re-creation of reality by our motile organs, our antennæ as it were, which we have held to be the very basis of all awareness. The child proceeds, slowly and with faltering steps, to explore his environment, and as he does so his words become articulate. We are convinced that in this conception of thought as a journey of exploration, lies the secret of syntax: "papa—hen—corn—cap"; "Daddy—school—man—auto"; Writer—tell—syntax—more—next—Chapter.

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