Monographs of the
SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT, INC.
Volume XV · Serial No. 51 · No. 1 · 1950

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HEINZ WERNER
and
EDITH KAPLAN

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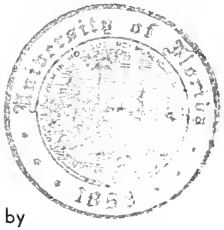

Printed in U.S.A.

Published by
CHILD DEVELOPMENT PUBLICATIONS
of the Society for Research in Child Development, Inc.
Fayerweather Hall, East, Northwestern University
Evanston, Illinois

ACKNOWLEDGEMENTS

This study has been carried out under a two-year grant from the Social Science Research Council. The authors wish to thank Mr. S. David Wexler, principal of P.S. 180 for making available to us the subjects for our study and the facilities of P.S. 180, New York.

We also wish to express our thanks to Mr. Philip Brandis for his assistance in the experimentation. We are particularly indebted to Mr. Bernard Kaplan who made many helpful suggestions and aided us at every phase of this investigation.

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Introduction

THE WORD-CONTEXT TEST; MATERIAL AND PROCEDURE

The child acquires the meaning of words principally in two ways. One is by explicit reference either verbal or objective; he learns to understand verbal symbols through the adult's direct naming of objects or through verbal definition. The second way is through implicit or contextual reference; the meaning of a word is grasped in the course of conversation, i.e., it is inferred from the cues of the verbal context. It is probably true that during the early years the child learns the meaning of verbal symbols predominantly in concrete situations: through handling of objects in the presence of adults, direct pointing, naming, and the like. As the child grows older learning of words occurs more and more through verbal contexts, and it is here that the observation of Ogden and Richards concerning the acquisition of a vocabulary particularly applies: "It is rare for words to be formed into contexts with non-symbolic experience directly, for as a rule they are learnt only through other words. We early begin to use language in order to learn language. . . ." (14, pp. 213f).

The present study endeavors to investigate experimentally the processes underlying the acquisition of word meaning through verbal contexts. For this purpose the "Word-Context Test" was designed. This test employs artificial words embedded in sentences. The subject going from one context to another is expected to arrive finally at the meaning of the word. Each of these artificial words signifies either an object or an action varying in degrees of concreteness. There are twelve series of six sentences each. The sentences in each series are, in general, ordered in such a way that, as a child moves from one sentence to the next, the clues increase in definiteness. Each sentence is printed on a separate card. The twelve series of sentences are as follows:

I. CORPLUM (adequate translation — stick, or piece of wood)
   1. A CORPLUM MAY BE USED FOR SUPPORT.
   2. CORPLUMS MAY BE USED TO CLOSE OFF AN OPEN PLACE.
   3. A CORPLUM MAY BE LONG OR SHORT, THICK OR THIN, STRONG OR WEAK.
   4. A WET CORPLUM DOES NOT BURN.
   5. YOU CAN MAKE A CORPLUM SMOOTH WITH SANDPAPER.

6. THE PAINTER USED A CORPLUM TO MIX HIS PAINTS.

II. HUDRAY (grow, increase, expand, etc.)
1. IF YOU EAT WELL AND SLEEP WELL YOU WILL HUDRAY.
2. MRS. SMITH WANTED TO HUDRAY HER FAMILY.
3. JANE HAD TO HUDRAY THE CLOTH SO THAT THE DRESS WOULD FIT MARY.
4. YOU HUDRAY WHAT YOU KNOW BY READING AND STUDYING.
5. TO HUDRAY THE NUMBER OF CHILDREN IN THE CLASS THERE MUST BE ENOUGH CHAIRS.
6. YOU MUST HAVE ENOUGH SPACE IN THE BOOKCASE TO HUDRAY YOUR LIBRARY.

III. CONTAVISH (hole)
1. YOU CAN'T FILL ANYTHING WITH A CONTAVISH.
2. THE MORE YOU TAKE OUT OF A CONTAVISH THE LARGER IT GETS.
3. BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE CONTAVISHES.
4. YOU CAN'T FEEL OR TOUCH A CONTAVISH.
5. A BOTTLE HAS ONLY ONE CONTAVISH.
6. JOHN FELL INTO A CONTAVISH IN THE ROAD.

IV. PROTEMA (finish, complete)
1. TO PROTEMA A JOB YOU MUST HAVE PATIENCE.
2. IF A JOB IS HARD HARRY DOES NOT PROTEMA IT.
3. PHILIP ASKED JOHN TO HELP HIM PROTEMA HIS HOMEWORK.
4. JOHN CANNOT PROTEMA THE PROBLEM BECAUSE HE DOES NOT UNDERSTAND IT.
5. YOU SHOULD TRY TO PROTEMA YOUR HOMEWORK WHEN IT IS ONLY HALF DONE.
6. THE PAINTER COULD NOT PROTEMA THE ROOM BECAUSE HIS BRUSH BROKE.

V. ASHDER (obstacle, obstruction)
1. A LAZY MAN STOPS WORKING WHEN THERE IS AN ASHDER.
2. AN ASHDER KEEPS YOU FROM DOING WHAT YOU WANT TO DO.
3. MR. BROWN SAID TO MR. SMITH, "I DON'T THINK WE SHOULD START WITH THIS WORK BECAUSE THERE ARE ASHDERS."
4. THE WAY IS CLEAR IF THERE ARE NO ASHDERS.

5. BEFORE FINISHING THE TASK HE HAD TO GET RID OF A FEW ASHDERS.
6. JANE HAD TO TURN BACK BECAUSE THERE WAS AN ASHDER IN THE PATH.

VI. SOLDEVE (wither, fade)

1. THE DINNER WAS GOOD BUT THE FRUIT WE ATE WAS SOLDEVE.
2. WHEN WE WERE DRIVING IN THE EVENING WE DID NOT FEEL SAFE BECAUSE THINGS ON THE ROAD SEEMED TO SOLDEVE.
3. THE OLDER YOU GET THE SOONER YOU WILL BEGIN TO SOLDEVE.
4. PEOPLE LIKE A BLOSSOMING PLANT BETTER THAN ONE THAT IS SOLDEVE.
5. PUTTING THE DRESS ON THE SUNNY LAWN MADE THE COLOR OF THE CLOTH SOLDEVE.
6. BECAUSE THE WINDSHIELD WAS FROZEN THINGS LOOKED SOLDEVE.

VII. SACKOY (courage)

1. WE ALL ADMIRE PEOPLE WHO HAVE MUCH SACKOY.
2. YOU NEED SACKOY WHEN YOU START TO DO A HARD JOB.
3. IF YOU HAVE DONE SOMETHING WRONG AND YOU ARE NOT AFRAID TO TELL THE TRUTH YOU HAVE SACKOY.
4. A PERSON WHO SAVES A BABY FROM DROWNING HAS MUCH SACKOY.
5. SOLDIERS MUST HAVE SACKOY WHEN THEY ARE ON THE BATTLEFIELD.
6. YOU NEED SACKOY TO FIGHT WITH A BOY BIGGER THAN YOU.

VIII. PRIGNATUS (deceive)

1. BOYS SOMETIMES PRIGNATUS THEIR PARENTS.
2. MARY DID NOT KNOW THAT JANE USED TO PRIGNATUS.
3. MOTHER SAID, "JIMMY YOU SHOULD NEVER PRIGNATUS YOUR OWN MOTHER."
4. IF YOU PRIGNATUS SOMEONE YOU WILL NOT GET AWAY WITH IT OFTEN.
5. A GOOD MAN WHO TELLS THE TRUTH WILL NEVER PRIGNATUS YOU.

6. IF JOHN PRIGNATUSES SOMEBODY HE MAKES SURE THEY DON'T FIND OUT.

IX. BORDICK (fault)
1. PEOPLE WITH BORDICKS ARE OFTEN UNHAPPY.
2. A PERSON WHO HAS MANY BORDICKS IS NOT WELL LIKED.
3. THE PLAN TO BUILD A HOUSE WAS A BORDICK BECAUSE IT COST TOO MUCH.
4. PEOPLE TALK ABOUT THE BORDICKS OF OTHERS AND DON'T LIKE TO TALK ABOUT THEIR OWN.
5. A PERSON HAS MANY BORDICKS BECAUSE HE DOESN'T LISTEN TO WISE MEN.
6. IF YOU ARE SMART AND WORK HARD YOUR WORK WILL NOT HAVE A BORDICK.

X. LIDBER (gather)
1. ALL THE CHILDREN WILL LIDBER AT MARY'S PARTY.
2. THE POLICE DID NOT ALLOW THE PEOPLE TO LIDBER ON THE STREET.
3. THE PEOPLE LIDBERED ABOUT THE SPEAKER WHEN HE FINISHED HIS TALK.
4. PEOPLE LIDBER QUICKLY WHEN THERE IS AN ACCIDENT.
5. THE MORE FLOWERS YOU LIDBER THE MORE YOU WILL HAVE.
6. JIMMY LIDBERED STAMPS FROM ALL COUNTRIES.

XI. POSKON (justice)
1. YOU SHOULD TRY TO GIVE POSKON TO OTHER PEOPLE.
2. IF YOU BELIEVE IN POSKON YOU ARE A GOOD PERSON.
3. THE CHILDREN WILL LIKE THAT TEACHER BECAUSE SHE BELIEVES IN POSKON.
4. PEOPLE WILL ALWAYS BE AFRAID WHEN THERE IS NO POSKON.
5. SOME BAD PEOPLE DO NOT LIKE POSKON BECAUSE THEY DON'T WANT TO BE PUNISHED.
6. THERE IS NO POSKON WHEN A THIEF IS NOT PUNISHED.

XII. ONTRAVE (hope)
1. ONTRAVE SOMETIMES KEEPS US FROM BEING UNHAPPY.
2. IF YOU ONTRAVE A GOOD MARK YOU MUST ALSO WORK FOR IT.

3. WE ONTRAVE GOOD THINGS TO HAPPEN TO US.
4. IT IS SILLY TO ONTRAVE THINGS THAT ARE NOT POSSIBLE.
5. JOHNNY ONTRAVED THAT MARY WOULD LIKE HIM.
6. ACCORDING TO WHAT THE DOCTOR SAID THE CHILDREN COULD NOT ONTRAVE THAT THEIR MOTHER WOULD GET WELL.

To prevent a conventional test atmosphere we aimed at a close rapport between the experimenter and the child. A preliminary study clearly indicated that a cold school atmosphere, such as prevails in many testing situations, brings about stereotyped responses and inhibits free conversation during the interview. Therefore, the examiner spent a considerable time getting acquainted with the child and familiarizing him with the task at hand. The child was informed that he would be presented with twelve words which he never heard before; that these words were used in a little town out West and were not spoken anywhere else. It was made clear to him that each word had only one meaning throughout the six sentences. The experimenter concluded with, "I want you to try to find out what these words mean. I will show you one sentence at a time. After you read the sentence tell me what you think the word may mean. Tell me everything you are thinking."

After the child responded to the first sentence, he was asked in what way and why the meaning given fit in the sentence. He was then presented with the second sentence while the first was still in view. After his response he was again asked how the word fit the context, and whether or not it fit the preceding sentence and why. When the examiner did not clearly understand the child's statements he would urge the child to elaborate.

All the responses were recorded. Depending on the age some variations in the manner of applying the test were deemed necessary. Whereas with the older children the verbal instructions were sufficient the younger children required some examples before the test was administered. In any case the instructions were repeated at any time during the test when it was apparent that the child had lost track of the task.

For the purpose of analysis, three judges derived 60 criteria from a preliminary inspection of the protocols. These criteria, pertaining to linguistic as well as semantic characteristics, were then employed by the three judges in the final analysis.

The subjects considered in this investigation were children between the ages of 8-6 and 13-5. The interquartile I.Q. range was from 101 to 111. In all, 125 children (60 boys and 65 girls) were tested; there were 25 children in each age group. The five age groups will henceforth be designated by the following Roman numerals:

Group I: 8-6 to 9-5
Group II: 9-6 to 10-5
Group III: 10-6 to 11-5
Group IV: 11-6 to 12-5
Group V: 12-6 to 13-5

Each child was individually tested. The test itself was broken up into four parts, and given in four sessions, each of approximately one hour in duration.

The monograph is divided into three parts. Section I deals with a detailed qualitative and quantitative analysis of the results. Section II reviews synoptically the results reported in Section I and attempts to evaluate these results in terms of general laws of development. The third section relates the findings of the present study to other empirical and experimental investigations.

We may add that the reading of Section I will be facilitated if the reader would first gain an over-all picture of the study by scanning Section II.

Section One

RESULTS: QUALITATIVE AND QUANTITATIVE ANALYSIS

The protocols of the children were subjected to an analysis of the quantitative and qualitative aspects of language behavior and its development. Our primary concern was with the processes of signification, i.e., with the ways meanings are given to words. However, a study of signification processes could not be divorced from an analysis of the more general and fundamental aspects of language behavior.

One of these aspects concerns linguistic structure which involves the comprehension of a word as a lexical unit, and of a sentence as an articulated pattern of words standing in a definite relation to each other.

Another fundamental aspect pertains to levels of symbolization. This involves the relation between a symbol and its "referent," i.e., the object to which the verbal sign refers. The varying degrees of directness and concreteness in this relation basically affect the processes of signification. If a child, for instance, thinks that the meaning of a word is directly conveyed by its sound pattern then he might not take cognizance of the presented verbal cues in the process of giving signification to the word.

Lastly there are some general characteristics of test-solving behavior that make their imprint on signification. The degree of rigidity and flexibility of performance are among these characteristics. The critical attitude of the child toward his own performance must also be taken into account. These general aspects of behavior, singly as well as interdependently, affect the processes of signification.

The analysis of these aspects of language behavior is preceded by a study of final solutions in terms of correctness and uniformity (conventionalization). The presentation of the results of this study and the discussion follows this general outline:

(1) Correctness and conventionalization.
(2) Processes of signification: formation of verbal concepts; the ways meanings are given to an artificial word.
(3) Perception and handling of linguistic structure during signification.
(4) Forms of symbolic behavior.
(5) Rigidity, flexibility and the autocritical attitude in test activity.

I. ANALYSIS OF FINAL SOLUTIONS

The first part of our analysis is directed toward a quantitative study of the solutions obtained by the child. There are several aspects to this analysis: one is correctness of solutions; another, to a certain extent related to the first but not identical with it, is uniformity of the solutions within a given age group. This latter aspect involves the genetic problem of conventionalization of language usage; it also includes the problem of the development of versatility in language behavior, i.e., synonymity or equivalence of verbal symbol usage.

A. Correctness and Completeness of Final Solution

The test was constructed in such a way that, semantically, only one solution was possible for each series. Any of these solutions given by the child was counted correct only if the child reported that it fit all six sentences. The incorrect solutions were subdivided into two types. Under subtype "Incomplete-Final" we included any final solution which, whether objectively correct or not, was offered in spite of the child's recognition that it fit only some of the sentences and not all. Subtype "Incorrect-Complete" consisted of wrong final solutions which supposedly fit all six sentences within a series.

TABLE I

Final Solutions

Age Group	Age in Years	Correct			Incomplete-Final*			Incorrect-Complete**			No Solution		
		Total	%	Mean	Total	%	Mean	Total	%	Mean	Total	%	Mean
I	9	20	6.7	0.8	144	48.0	5.8	84	28.0	3.3	52	17.3	**2.1**
II	10	50	16.7	2.0	80	26.7	3.2	121	40.3	4.9	49	16.3	**1.9**
III	11	82	27.3	3.3	75	25.0	3.0	110	36.7	4.4	33	11.0	1.3
IV	12	100	33.3	4.0	81	27.0	3.2	88	29.4	3.5	31	10.3	1.3
V	13	143	47.7	5.7	61	20.3	2.4	69	23.0	2.8	27	9.0	1.1

* pertains to any final solution which does not fit all six sentences.
** pertains to wrong final solutions which supposedly fit all six sentences.

Table I summarizes the types of final solutions to each of the twelve tasks. The correctness of solution has been measured for each age group by the number of responses (absolute and relative) and by the average number per child (mean).

These measures show a steady increase in correctness from level to level. The significance of the difference between means of successive age groups has been tested by means of analysis of variance (F Test) and the t-test.

The correct solutions show a significant increase between age groups I and II, II and III, and IV and V, at the .01 level of

confidence. Whereas a child in age group I, on the average, does not quite attain one correct solution, a member of group V solves about half of the twelve series. The incorrect solutions show a general decrease from group to group. In particular, the incomplete-final solutions decrease sharply and significantly from the first age group to the second, with insignificant changes thereafter. The incorrect-complete solutions present a somewhat different picture. There is a significant increase from group I to II with a steady decrease thereafter. The instances where no solutions were obtained decrease, though not significantly, from age to age.

The steady increase in correctness throughout the age groups reflects the growing ability of the child to cope with the test situation by means of intellectual processes that will be discussed in the sections on signification and symbolization. It seems worthwhile to comment on the genetic changes that take place with respect to incorrectness. As mentioned above, there are differences in the developmental curves between the two subtypes of incorrectness. In particular, concomitant with an early increase in frequency of the incorrect-complete responses, there is a sharp decrease in incomplete-final responses. These concurrent changes suggest that there is a shift within the category of incorrect responses from the incomplete solutions to the complete solutions indicated by the distribution of both types in the first two age groups. In age group I the proportion of incomplete-final vs. complete-incorrect responses is approximately 9:4; conversely, the proportion for the second age group approximates 5:8. This shift reflects the maturing attitude of the child toward what constitutes a solution. The younger child does not recognize the necessity for integrating, by a single solution, the cues of all six contexts. With growing age the child seeks increasingly to fulfill this demand for integration, though his attempts may still result in wrong solutions.

B. Conventionalization

Another quantitative aspect of analysis of solutions is directed toward the general problem of variability of words and their meanings as they are derived from given verbal contexts. Language as a means of social communication within a given culture pre-supposes the use of symbols in a uniform way. One of the aspects of the socialization of a child as he grows into adult culture pertains to his increasing understanding that verbal symbols belong to an objective system of intercommunication rather than to one that is relatively private and egocentric in character.

In other words, conventionalization or standardization of language is one of the principal aspects of socialization of speech. A quantitative method of analyzing the developmental process of conventionalization is by means of the measure of variability of the words offered as a solution by groups of children. The development of conventionalization with increasing age would then be indicated by a decrease in the variability of the solutions. In order to determine the variability of word solutions and their change throughout the age groups a simplified method of measuring this variability was employed, introducing the dichotomy of "unique" vs. "nonunique" responses. We determined the frequency of occurrence of a particular solution for an artificial word within an age group. A solution occurring only once, i.e., given by only one of the 25 children comprising an age group, was classified as a "unique" response; conversely, a solution that occurred twice or more often was termed a "nonunique" response. With respect to unique and nonunique responses a further distinction was made pertaining to the difference between literal vs. semantic uniqueness and nonuniqueness. It appeared that a number of solutions though literally different belonged to the same meaning sphere. for example, stick—piece of wood; courage—guts; board—lumber; expand—increase—add to—enlarge; etc. We therefore proceeded to determine the semantic relationship between the various solutions offered for an artificial word. Three judges grouped the solutions into meaning spheres. On the basis of this classification we determined the semantic uniqueness of a solution. A word was considered semantically unique if it appeared only once and in addition did not share the meaning sphere with another, literally different solution. Table II summarizes the literal and the semantic variability of the solutions within each age group.

TABLE II

LITERAL AND SEMANTIC VARIABILITY OF SOLUTIONS: MEAN FREQUENCY

Age Groups	I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)
Literal Unique	4.9	3.8	3.7	3.2	2.5
Literal Nonunique	5.0*	6.3	7.0	7.5	8.4
Semantic Unique	3.5	2.9	2.5	2.0	1.3
Semantic Nonunique	6.4	7.2	8.2	8.7	9.6

* Since there are 12 solutions per child the mean number of unique plus nonunique should total 12 for each age group. That the totals are less than 12 is due to the occurrence of no solutions (blanks). For instance, for the first age group there are 4.9 literal unique solutions, 5.0 literal nonunique, and 2.1 no solutions.

As the table shows, there is a steady decrease of both the literally and semantically unique solutions; correspondingly, the nonunique solutions progressively increase. The over-all developmental change indicated by the difference between the first and the last age groups is significant at the .01 level for each of the four categories.

The developmental decline in variability as measured by the decrease in unique solutions and the increase in nonunique solutions denotes the growth of conventionalization of language with advancing age. In analyzing the process of conventionalization further, one finds that the rate of decline differs between the semantic and literal unique solutions. Semantic uniqueness declines more rapidly than literal uniqueness. This becomes evident from the ratios between the means of semantically and literally unique solutions tabulated below:

Age Groups	I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)
Ratio	3.5:4.9	2.9:3.8	2.5:3.7	2.0:3.2	1.3:2.5
Per cent*	71.4	76.3	67.6	62.5	52.0

* Ratio expressed in terms of percentage.

The question can be raised as to what are the factors underlying the difference in rate of decline? Obviously we do not only have to consider the literal variability of words used as solutions but also the variety of verbal expressions, i.e., the range of synonymity. At the lower age levels a group does not express itself through a great variety of words pointing to the same meaning; in other words, the range of synonymity is limited. With the more mature age groups the range of synonymity or semantic equivalence expands, i.e., although variability on the whole decreases the variety of expressions for any one meaning increases.

If one tabulates the number of synonymous expressions for the various meaning spheres one finds the following genetic relationships: on the first age level 86 per cent of the meaning spheres are composed of two synonymous expressions, 7 per cent composed of three, 7 per cent of four synonymous expressions; at the last age level there is an increase in the number of synonymous expressions within a sphere of meaning: 38 per cent of the spheres have two, 33 per cent have three, 24 per cent have four, and 5 per cent have five synonymous expressions.

At the younger levels where little synonymity exists the numerical discrepancy is slight between solutions that are literally different and those that are semantically different; at higher age levels many solutions that are literally different are semantically related. Thus the decline of solutions that are semantically unrelated, or unique, is steeper than the decline of literally unique solutions.

II. PROCESSES OF SIGNIFYING WORDS

As stated in the introduction the principal aim of this investigation is the study of the processes that are operative in the test solving activity regardless of correctness. We are particularly concerned with the genesis of signification, i.e., the ways by which children of various ages attribute meaning to a word with reference to contexts in which it appears. A process of signification involves the interdependence of two semantic aspects, viz., word meaning and sentence meaning. Adequate signification is based on the comprehension of a word as possessing a stable and relatively self-contained meaning; it also presupposes the perception and handling of a sentence as a semantically definite entity. Immature language behavior is characterized by an absence of such semantic stability; this is manifested by the multitude of ways the young child handles the word and sentence. Though the word meaning and sentence meaning in the actual process are interdependent, for the purpose of analysis, they will be treated separately. We turn first to the analysis of the ways word meanings are formed.

Immature language behavior, as mentioned above, lacks the distinctiveness in the relation of word to context that characterizes, at least in our culture sphere, mature verbal activity. A low degree of differentiation between word and sentence expresses itself in principally two ways, viz., *word-sentence fusion* and *embeddedness of word in sentence*. In word-sentence fusion the word is not conceived as a separate entity but contains elements of the sentence. In embeddedness of word in sentence, a word meaning, though not fused with the sentence, is so specifically and concretely a part of the verbal context that it cannot be divorced from it. We shall first deal with processes of signification that are based on the fusion of the word with the sentence.

A. Signification Based on Word-Sentence Fusion

The two varieties of word-sentence fusion that were observed may be briefly enumerated:

Sentence-core concept; the meaning given to the word carries with it essentially the total context of the sentence in which it appears.

Holophrastic gradient; the concept is not limited to the unknown word but carries neighboring parts and thus encompasses portions of the sentence.

1. *The Sentence-Core Concept*

a. *Holophrastic conceptualization and global sentence perception as underlying factors in formation of sentence-core con-*

cepts. As defined above, a sentence-core concept represents a word meaning which carries with it the context of the sentence in which it appears. One of the developmental factors inherent in sentence-core concepts is the so-called holophrastic conceptualization. Practically all observers of early language behavior have noted what has been called here the holophrastic characteristics of word meanings, i.e., at an early age, a word meaning appears to be far more inclusive than the conventional connotation. Words of this sort have as their referents situational contexts rather than delimited objects. In the sentence-core concept, the holophrastic content consists of the context of the sentence. A second factor underlying sentence-core concepts is the perception of the sentence as an undifferentiated whole; any portion of it, e.g., the unknown word, may represent the sentence content in toto or in part.

The following example illustrates well these underlying factors that lead to sentence-core concepts:

L.P. (9-5) — to sentence 4 of series IX — PEOPLE TALK ABOUT THE BORDICKS OF OTHERS AND DON'T LIKE TO TALK ABOUT THEIR OWN—responds as follows: "People talk about other people and don't talk about themselves, that's what bordick means." For sentence 6 of series XII—ACCORDING TO WHAT THE DOCTOR SAID THE CHILDREN COULD NOT ONTRAVE THAT THEIR MOTHER WOULD GET WELL—she said, "Ontrave means that the children don't think their mother would get well."

These may sound like simple restatements of the test sentences. That this is not the case is shown by the fact that the child takes this contextual meaning and tries to fit it in either the previous or the following sentences. For instance, L.P., after having given the response to BORDICK in sentence 4 of series IX (as stated above), tries to fit the contextual meaning for BORDICK into the first sentence of that series. The first sentence reads, PEOPLE WITH BORDICKS ARE OFTEN UNHAPPY. L.P. states, "People that talk about other people are unhappy." After having thus fit the contextual core concept into sentence 1, the child offers this interpretation: "because say this lady hears that someone is talking about her and then she'll get mad."

A core concept may manifest itself in various forms. It may appear as a seeming restatement, as illustrated above, or it may take on the form of a condensed sentence or finally, it may be expressed as an evaluation of the sentence content.

b. *Three forms of sentence-core concepts: seeming restatement, condensation, and evaluation of sentence context.* In the

example above, the word meaning appeared almost identical with the context of the sentence. The following are further illustrations of contextual core concepts expressed seemingly in terms of repetitions of the given sentences:

C.L. (8-11)—for sentence 4 of series VII—A PERSON WHO SAVES A BABY FROM DROWNING HAS MUCH SACKOY—reports that SACKOY means, "saving people from drowning." The same child gives the following meaning for ONTRAVE in sentence 5 of series XII—JOHNNY ONTRAVED THAT MARY WOULD LIKE HIM: "Ontrave means you have to be very good so people will like you." "To be very good" is the core of the meaning but it cannot be separated from the remaining part of the given context.

B.B. (9-3)—in response to sentence 6 of series II—YOU MUST HAVE ENOUGH SPACE IN THE BOOKCASE TO HUDRAY YOUR LIBRARY—says: "Hudray means you should have a good library," (i.e., you should have ample space in the bookcase).

There are other cases where the child seems to come closer to the understanding of the delimited nature of word meaning. However, his concept, though seemingly circumscribed, is nothing but a condensation of the sentence context of which it is a part:

H.W. (11-1) develops the concept of "feel good" from sentence 1 of series II: IF YOU EAT WELL AND SLEEP WELL YOU WILL (HUDRAY) "feel good." In sentence 2 of this series — MRS. SMITH WANTED TO HUDRAY HER FAMILY — he reports: "Mrs. Smith wanted to make her family 'feel good'." To sentence 3—JANE HAD TO HUDRAY THE CLOTH SO THAT THE DRESS WOULD FIT MARY—the child fits the concept contextually, "Jane makes the dress good to fit Mary so Mary 'feels good'." For sentence 4 — YOU HUDRAY WHAT YOU KNOW BY READING AND STUDYING—the child reports: "Well, after reading and studying you 'feel good,' at least you learn something and you know something." His response to sentence 5—TO HUDRAY THE NUMBER OF CHILDREN IN THE CLASS THERE MUST BE ENOUGH CHAIRS — is: "When there are enough chairs for the children in the class they 'feel good'." Sentence 6 reads, YOU MUST HAVE ENOUGH SPACE IN THE BOOKCASE TO HUDRAY YOUR LIBRARY. H.W. reports: "If you have enough space in the bookcase to put in some books, you 'feel good'." The over-all concept of HUDRAY, according to the child, is "feel good."

J.Z. (9-6) develops a contextual core concept "hard things" for sentence 3 of series XI—THE CHILDREN WILL LIKE THAT TEACHER BECAUSE SHE BELIEVES IN POSKON—; she says: "Like the teacher don't like hard things and they give the children easy things, like easy arithmetic examples, so they don't learn, so they don't like her, but they like the teacher who gives them hard work, so it means 'hard things'." "Hard things" is fit into sentence 1 of this series—YOU SHOULD TRY TO GIVE POSKON TO OTHER PEOPLE — in the following manner: "'Hard things' fits, like when a teacher is very dumb and the children are smart and they want to learn more 'hard things,' she should try to give them more 'hard things' so they can learn." "Hard things" represents a particular context, namely —learning difficult things in school—which is superimposed on the various sentences. The sentences are thus integrated by a forced assimilation; in the first sentence YOU= "teacher," POSKON= "hard things," PEOPLE= "children."

There are instances where the condensed product is outwardly a single word, though functionally it is still a sentence-core concept.

N.F. (9-0) gives as an over-all solution for ONTRAVE in series XII: "do." "Do" fits, according to the child, the various sentences as follows: for sentence 2 - IF YOU ONTRAVE A GOOD MARK YOU MUST ALSO WORK FOR IT - he responds, "Yeah, the teacher tells you to go on an errand and says, 'Do' this for me." Sentence 3 - WE ONTRAVE GOOD THINGS TO HAPPEN TO US - yields this response: "We want good things to happen to us, yeah we 'do'." Here the child uses "want" in place of ONTRAVE but it is not considered as the solution. In sentence 4 the difference between the contextual concept and a circumscribed meaning of "do" is strikingly clear. The child says: "It is silly to do things that are not possible. It doesn't fit because that's about doing things that are not possible and ontrave means 'doing things'." He states for the fifth sentence—JOHNNY ONTRAVED THAT MARY WOULD LIKE HIM: "Yeah, Johnny told Mary, 'Do' you like me?"

M.B. (9-9) has as solution for BORDICK in series IX: "smart," which he evolved from sentence 6 — YOUR WORK WILL NOT HAVE A "D" (BORDICK) IF YOU ARE SMART AND WORK HARD—"bordick means smart so you won't get a D." Sentence 5 elicits this response, "smart fits—the wise man is 'smart' and the other man didn't take his advice, he got sicker and couldn't get up and had to stay in bed for a month." In

4, "People talk about the children of others who are 'smart' and don't like to talk about their own children and how dumb they are." For sentence 3 he says, " 'Smart' fits because the man knew the stuff was too high and cost too much and wasn't good so the man was 'smart' (not to build the house with that stuff)."

The core concept has been discussed up to now as representing the condensed or paraphrased meaning of a context. As mentioned above, the core concept may appear in the form of an evaluation of the sentence content rather than denoting the objective sentence context.

E.K. (10-9) responds to sentence 3 of series IX: "The plan to build a house 'wasn't used.' It doesn't fit the other sentences." Then she continues referring to the fact that the house cost too much: "This is awful—so 'awful' fits the sentences; it fits the first," (referring to her former response), "People with 'diseases' are often unhappy." The child remarks, "A person who had a disease and was sick in bed and couldn't walk around, well, they would think it was 'awful' to have it." Referring to sentence 2 of this series, she says, "With the one I said 'fights' (A person who has many 'fights' is not well liked) 'awful' fits too, well, a person who has many fights is not well liked because other people would think it was 'awful' to fight." To sentence 3, the response is, "The architect that made the plans and heard that it cost too much and it couldn't be used, he will think that it would be 'awful'."

L.P. (9-5) has developed mostly singular, concrete concepts for each of the five sentences of series VI. Having given a solution for sentence 6 — BECAUSE THE WINDSHIELD WAS FROZEN THINGS LOOKED "frozen" (SOLDEVE) — the child offers "funny" as the final over-all solution. What the child obviously means is that the view through the frozen glass is peculiar. Coming back to the second sentence — WHEN WE WERE DRIVING IN THE EVENING WE DID NOT FEEL SAFE BECAUSE THINGS ON THE ROAD SEEMED TO SOLDEVE —the child reports: " 'Funny' fits because maybe on the window in front of you driving there is frost on the windows so things look 'funny'."

As we have observed on previous occasions, sentence fitting in terms of circumscribed solutions may coexist with the evaluative core concept. Although, in the illustration above, "frozen" fits into the various sentences, it is not considered the over-all concept. It is the evaluative core concept "funny" which constitutes the final solution.

W.P. (10-6) responds to sentence 1 of series XII as follows: People (ONTRAVE) SOMETIMES KEEPS US FROM BEING UNHAPPY. "Say this girl she wants a doll and her father buys it for her, she's happy. Her father is a 'people'." The solution which this child supplies for the second sentence is "get." IF YOU "get" A GOOD MARK YOU MUST ALSO WORK FOR IT. The over-all solution is "happy" and it coexists with "get." The child remarks, "The father bought the girl a doll, she was very 'happy.' The boy who got the good mark was 'happy' too, so 'happy' fits both."

Again it may be noted that in the course of fitting solutions in a given test series, a concept, originally circumscribed, may become an evaluative core concept.

E.K. (10-9) evolves the meaning "be strong" for the first two sentences of series II, (IF YOU EAT WELL AND SLEEP WELL YOU WILL "be strong," and MRS. SMITH WANTED "her family to 'be strong' "). Presented with the problem of fitting the concept "be strong" into the third sentence, the child's resolution is, "Jane had to cut the cloth so that the dress would fit Mary," and remarks, "A person has to 'be strong' to cut the cloth."

An analogous solution is that presented by A. R. (8-11). He uses the word meaning "smart" in a circumscribed way for the first two sentences of series II. It becomes an evaluative core concept in the third sentence: "Jane had to sew the cloth smaller so that the dress would fit Mary. Jane is 'smart' she knows how to do it."

L.B. (10-1) has as solution for LIDBER in series X, the word-meaning "happy" which fits all the sentences in the series. For instance, in sentence 3, PEOPLE "were happy" ABOUT THE SPEAKER WHEN HE FINISHED HIS TALK, "because he said his speech about the company getting more money maybe." In the last sentence "happy" is an evaluative core concept coexisting with a circumscribed word-meaning which is substituted for LIDBER: JIMMY "collected" STAMPS FROM ALL THE COUNTRIES. "He was 'happy' when the stamps came from all the countries to his collection."

The nature of sentence-core conceptualization may be even more impressively demonstrated by negative instances, i.e., in the cases where the child is unable to fit a concept attained in one sentence into another. When the child gives his reasons for this inability it becomes evident that he actually was dealing with a sentence-core concept.

G.D. (9-3) has the solution "poison" for sentence 4 of series III—YOU CANNOT FEEL OR TOUCH "poison" (A CONTAVISH). This solution does not fit sentence 1—YOU CAN'T FILL ANYTHING WITH A CONTAVISH—"because," as the child says, "there is nothing to feel or touch." Similarly the solution for sentence 6, "water"—JOHN FELL INTO "water" (A CONTAVISH) IN THE ROAD—cannot be used for sentence 1, "because this sentence doesn't tell you that John fell into a contavish."

In both examples the concept (poison, water) was so strongly fused with the verbal context that it could not be placed into a sentence that did not have the conspicuous verbal elements from which the core concept was constructed.

Similarly, A.E. (9-9) has the concept "books" for sentence 6 of series II—YOU MUST HAVE ENOUGH SPACE IN THE BOOKCASE "for 'books' in your library." "Books" fits only sentence 4—YOU HUDRAY WHAT YOU KNOW BY READING AND STUDYING—"because this has to do with 'books'." The concept does not fit the other sentences "because," as the child says, "this sentence is about books and library, and this sentence" (sentence 1) "is about eating and sleeping."

N.F. (9-0) supplies "homework" for PROTEMA in sentence 5 of series IV—A CHILD SHOULD TRY TO PROTEMA HIS HOMEWORK WHEN IT IS ONLY HALF DONE. "Homework" doesn't fit the first sentence—TO PROTEMA A JOB YOU MUST HAVE PATIENCE—"because that sentence" (sentence 1) "is about patience and that sentence" (sentence 5) "is about a half of his homework."

L.P. (9-5) uses "think" as the solution for ONTRAVE in sentence 5 of series XII: JOHNNY "thinks" (ONTRAVED) THAT MARY WOULD LIKE HIM. This child refused to accept "think" as the solution for sentence 4 of this series—IT IS SILLY TO ONTRAVE THINGS THAT ARE NOT POSSIBLE—stating, "it doesn't fit because if Johnny thinks that Mary would like him, this is possible not impossible." This statement again reveals that the solution "think" was not conceived as a circumscribed word meaning but represented a whole context, viz., "think that Mary would like him," and it is this contextual meaning which he could not reconcile with the content of sentence 4.

c. *Sentence-core conceptualization as a function of difficulty of integration: assimilation.* A young child may form a sentence-core concept, as demonstrated above, when dealing with an individual sentence. There are many children, who do not use a core-concept for an individual sentence, but may re-

gress to core-conceptualization when confronted with the task of finding an over-all concept common to two or more sentences. The following examples illustrate such regression to core-conceptualization as a primitive means of integrating the meaning of a word which is embedded in two different sentences:

J.P. (10-0) finds the solution "get" for sentence 1 of series IV, "quit" for sentence 2:—What does PROTEMA mean in both sentences?—is asked by the examiner. The child answers, "A job, yeah they even say it, they even have the word job in there." Going on to sentence 3, he finds the solution "do," and for sentence 4, he offers the solution "solve." Again asked about the over-all meaning, the child says "job." Continuing, the child presents as solution for sentence 5 "complete," and as solution for sentence 6 "finish." When asked again for the over-all meaning for PROTEMA, the child says "job"—"yeah, the painter could not finish the 'job' because his brush was broken."

H.R. (9-3) has found the meaning "play" for LIDBER in series X. It fits the sentences, e.g., sentence 1: ALL THE CHILDREN WILL "play" (LIDBER) AT MARY'S PARTY, etc. When he comes to sentence 5 he states: "The more flowers you pick off, the more you will have next year—I mean lidber means 'play'—if I pick a lot of flowers or roses I can 'play' flower store."

This same child, throughout series V, is able to fit a meaning into various sentences spontaneously, but if asked for the over-all meaning he presents the examiner with a contextual core concept. His protocol reads as follows. For sentence 4 of series V: THE WAY IS CLEAR IF THERE "is no 'snow'." It fits in sentence 1: A LAZY MAN STOPS WORKING WHEN THERE "is snow." "Snow" is also the solution for sentences 2 and 3. However, when the examiner asks for the over-all meaning, the child says, "ashder means work." When he comes to sentence 6, he changes the solution from "snow" to "hole." Sentence 1 reads now: A LAZY MAN STOPS WORKING WHEN THERE IS "a 'hole,' because a lazy man doesn't like to dig a hole"; sentence 2: "If there is a 'hole' in the ground and you want to build a house you can't do it." Similar explanations are offered for sentences 3, 4 and 5. But the over-all meaning of ASHDER for the child is still: " 'work,' I stick to it."

The outstanding peculiarity of this solving behavior is the discrepancy between the type of solutions which fit the sentences and the over-all solution. It is apparent that here the contextual core has been formed because of the task of simultaneously bringing together the solutions for all the sentences.

Whereas the child is often quite able to fit successively a meaning into each of the sentences, he regresses to contextual signification if a simultaneous integration is requested of him. The difficulty which the child displays in finding an over-all solution, even when he has already given identical solutions for each sentence, is most probably due to the fact that each of the solutions is concretely embedded in the individual contexts and cannot be isolated. Since the word is not separable from the sentence, the child, pressed for integration, has to resort to integration of contexts rather than words. The core concepts, representing each a whole sentence, can be made identical by interpreting the sentences in an identical way. This procedure of equating sentence meanings we have termed *assimilation.* Assimilation will be discussed more extensively in the section that treats the various ways a child deals with sentence meaning.

2. *The Holophrastic Gradient*

The holophrastic gradient is closely related to contextual core conceptualization. In both cases the basic factor is the comprehension of sentences or phrases as undifferentiated wholes rather than as constructs of discrete units. A typical holophrastic gradient consists of a concept not limited to the unknown word —it spreads to its neighboring parts thus encompassing portions of the sentence.

To illustrate: sentence 6 of series VII reads: YOU NEED SACKOY TO FIGHT WITH A BOY BIGGER THAN YOU. In reading the sentence one of the children substituted "to know how" for SACKOY; but when asked for the meaning of SACKOY or when the child himself fitted the meaning for SACKOY into another sentence it became apparent that the neighboring parts had been included. SACKOY thus acquired the meaning "need to know how to fight."

In the following, a number of examples of holophrastic gradients are presented.

J.H. (10-0) fits the concept "collect" in sentence 6 of series X: JIMMY "collected" STAMPS FROM ALL COUNTRIES. The solution becomes extended to "collected stamps." The child says: "It fits sentence 2" (of the same series): THE POLICE DID NOT ALLOW THE PEOPLE TO "collect stamps" ON THE STREET, "because it wouldn't be tidy to 'collect stamps' on the street on a windy day, they would all be flying around."

B.A. (9-10) forms the solution "wood" for sentence 5 of series I—YOU CAN MAKE "wood" SMOOTH WITH SANDPAPER. The solution becomes extended to "smooth wood." The extended

concept fits sentence 1: "If they want 'smooth wood' you can support them" (supply them) "with it."

J.D. (10-7) offers solution "get" for sentence 2 of series XII: IF YOU "get" A GOOD MARK YOU MUST ALSO WORK FOR IT. The extended solution is "get a good mark" which is fit into sentence 1 as follows: "To 'get a good mark' "KEEPS US FROM BEING UNHAPPY.

The same child supplies the solution "be bad" for sentence 3 of series VIII: MOTHER SAID, "JIMMY YOU SHOULD NEVER "be bad" TO YOUR OWN MOTHER. "Be bad" is extended to "bad to your mother." It is fit into sentence 6 of this series: IF JOHN "is bad to his mother" HE MAKES SURE THEY DON'T FIND OUT.

In some instances there may be a reformulation of the gradient solution which conceptually includes the neighboring parts:

D.W. (8-7) offers "toys" as solution for sentence 1 of series XI: YOU SHOULD TRY TO GIVE "toys" TO OTHER PEOPLE. "Toys" is extended to "give toys" and it is this extended concept which is reformulated to "sharing." "Sharing" fits sentence 2: IF YOU BELIEVE IN "sharing" YOU ARE A GOOD PERSON. "I believe in it."

The displaced gradient. In many instances, after a gradient has been developed, the original circumscribed word drops out and the neighboring parts of the sentence become the concept which is then used for the various other sentences.

These are illustrations of displacement:

N.F. (9-0) offers "do" as solution for sentence 3 of series IV: PHILIP ASKED JOHN TO HELP HIM "do" HIS HOME-WORK. PROTEMA, for this child, means "do the homework," and he then proceeds to fit the concept "homework" into the other sentences.

M.B. (9-8) has the solution "get" for sentence 2 of series XII: IF YOU "get" A GOOD MARK YOU MUST ALSO WORK FOR IT. ONTRAVE is interpreted to mean "get a good mark." This child then proceeds to fit "a good mark" into the other sentences, e.g., into sentence 1: "A good mark" KEEPS YOU FROM BEING UNHAPPY.

A.C. (9-0) fits "energy" in sentence 5 of series VII: SOLDIERS MUST HAVE "energy" (SACKOY) WHEN THEY ARE ON THE BATTLEFIED. SACKOY, for her, means "soldiers must have energy." It becomes displaced for the first sentence of the series; the child now says: WE ALL ADMIRE PEOPLE WHO "are 'soldiers,' they are our great men, that's why I think it does fit."

C.L. (8-11) replaces HUDRAY with "smarter" in sentence 4 of series II: "You get 'smarter' everyday when you read and study." For this child HUDRAY means "get smarter by study." The child then fits the displaced gradient "study" into sentence 3: JANE HAD TO "study" THE CLOTH SO THAT THE DRESS WOULD FIT MARY.

The process of displacement is much more general than implied by the previous illustrations. It appears to operate not only with reference to given parts of the sentence but with respect to global ideas not linguistically expressed but associated by the child with the word. If a child uses a meaning in a situational sense, i.e., holophrastically, the original focal part may drop out and the remaining part now represents the meaning. The following example may serve as illustration:

L.B. (10-1) supplies a holophrastic concept "plaster" (a situation in which a trowel used for plastering is involved); it is fit in sentence 3 of series III: BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE "plaster." Fitting "plaster" into sentence 1, the child says: "A tray, you know, a flat thing with a handle on it" (a trowel) "and you put plaster on it and you put plaster on the wall—well you can't fill anything with a 'flat tray'" (trowel). Here the global situation involving "tray and plaster" becomes reduced to "tray" in order to fit sentence 1.

At times the characteristic process underlying displacement leads to a circular manner of fitting word meanings. This we termed *circular displacement*. Essentially, this is what happens: the child uses a gradient A (original concept) plus B (neighboring words) in sentence 1; employs the displaced gradient (B) for sentence 2; coming back to sentence 1, he treats it like a new sentence into which the displaced gradient now fits. Oblivious of the fact that he has taken that very word from the sentence, he views the presence of that word in the sentence as a confirmation for fitness. For example:

S.G. (10-6) fits "a sickness" in sentence 2 of series IX: A PERSON WHO HAS "a sickness" IS NOT WELL LIKED, "they don't like him 'cause they can catch it from him." In sentence 3, the displaced gradient, "they don't like it," is applied: "'They don't like it' because it cost too much." Going back to sentence 2, the child reports, "'he is not liked'—it even tells you (!) he is not liked."

N.F. (9-0) presents "God" for sentence 3 of series XI: THE CHILDREN WILL LIKE THAT TEACHER BECAUSE SHE BELIEVES IN "God." For sentence 5 the displaced gradient con-

cept is "teachers": "Some bad people do not like 'teachers' (POSKON) because they don't want to be punished." When he comes back to sentence 3 he states: " 'teachers' fits—the children will like that teacher because she believes in God and because it says she's a 'teacher' too."

As previously mentioned, there is an intimate relationship between the gradient concept (including the displaced gradient) and the contextual-core concept. Both are based on a holophrastic comprehension of word meaning, with this difference: whereas the core concept refers—explicitly or implicitly—to a total situation expressed by the sentence, the gradient concept includes a relatively small sentential unit. The close alliance between the two processes is indicated by the frequent transition or transformation of a gradient or displaced concept into a core concept. This occurs in principally two ways: the gradient may either be further expanded beyond neighboring parts to include a now greater portion, even to include the whole sentence meaning, or it may be in itself already sufficiently extended to become the core of the total situation expressed by the sentence. For example:

S.G. (10-6) supplies "do" for sentence 1 of series II: "To 'do' a job you must have patience." Sentence 2: IF A JOB IS HARD HARRY DOES NOT "do" (PROTEMA) IT. PROTEMA means "hard to do" and it fits sentence 1: "It's a 'hard job to do' and you must take it easy and you must have patience."

The over-all concept "too hard to do" already has such an extended meaning that it becomes the core for the sentences.

B. Signification Based on Embeddedness of Word in Sentence

Three forms of signification based on word-sentence embeddedness were distinguished: aggregation of individual solutions, pluralization and transposition.

1. *Aggregation of Individual Solutions*

One of the primitive ways by which the child attempts to signify the artificial word is by means of aggregation or fusion of several concepts: the over-all meaning is achieved by the combination of solutions that were formed independently for individual sentences. At the basis of this procedure is the strong embeddedness of a word meaning in its sentential context. Unable to lift individual solutions out of their contexts, the child carries them into a combined end solution.

A typical procedure is then this: a concept A has been formed concretely fitting sentence 1. Coming to sentence 2 the

child offers another meaning B appropriate for this context. Returning to 1 he cannot modify or replace A with respect to B because A has become an integral part of sentence 1. An end solution fitting both sentences may be formed by adding B to A.

A number of different types of such combinations of A and B have been observed; in the following, illustrations of these various forms will be given. This classification into various types should, however, not be understood as an absolute one; there is considerable overlap between the forms.

a. *Aggregation by situational relationship.* Two solutions, A and B, are combined by forming an over-all situation of which both solutions are a part. This is one of the most frequent forms of solution aggregation. In the following illustration "paint" and "air" enter as part of a comprehensive situation.

S.L. (9-1) offers "paint" as solution for sentence 3 of series III: BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE "paint" (CONTAVISHES). The solution for sentence 4 of this series is "air." YOU CAN'T FEEL OR TOUCH "air" (A CONTAVISH). The over-all solution, "paint and air," fits into sentence 3 in this manner: "The walls must have 'air' before the house is finished so the 'paint' will dry."

For the same series, sentence 3, G.D. (9-3) uses the solution "dry": BEFORE THE HOUSE IS FINISHED THE WALLS MUST "be 'dry'." The solution for sentence 4 is "poison": YOU CAN'T FEEL OR TOUCH "poison." The over-all solution for this child is "dry and poison." It fits sentence 4, "because 'poison' could be 'dry'."

H.R. (9-3) supplies solution "coat" for sentence 1 of series I. A "coat" MAY BE USED FOR SUPPORT (protection). The solution for sentence 2 of this series is "door": "Doors" MAY BE USED TO CLOSE OFF AN OPEN PLACE (closet). The over-all solution is "door and coat," which fits sentence 1, "because theres a 'door' to a closet and you hang your 'coat' up in the closet."

J.P. (9-3) presents "mice" as the solution for sentence 1 of series IX. PEOPLE WITH "mice" (BORDICKS) ARE OFTEN UNHAPPY. Her solution for sentence 3 of this series is "given up": THE PLAN TO BUILD THE HOUSE WAS "given up" (A BORDICK) BECAUSE IT COST TOO MUCH. The over-all solution is "given up and mice." Fits 1: "People with 'mice' have usually 'given up' trying to get them out."

This same child going on to series X offers "go" as solution for sentence 1: ALL THE CHILDREN WILL "go" (LIDBER) AT

MARY'S PARTY. Her solution for sentence 3 is "get his autograph": "The people 'get his autograph' when he finished his talk." The over-all solution is "go and get his autograph." It fits in sentence 1 in the following way: "The children will 'go and get his autograph'—when I said 'go' the first time—it still fits in it, because the children will 'go' to Mary's party and maybe a friend speaks there and they 'get his autograph'."

A.H. (10-0) has the solution "cardboard" for sentence 1 of series III. YOU CAN'T FILL ANYTHING (liquid) WITH "cardboard" (A CONTAVISH). For sentence 2 of the same series the solution offered is "room." THE MORE YOU TAKE OUT OF A "room" (CONTAVISH) THE LARGER IT GETS. The over-all solution is "cardboard and room." It fits the second sentence, "because the more 'cardboard' you take out of the 'room' the bigger the 'room' gets."

H.R. (9-3) presents "fire" as the solution for sentence 1 of series III: YOU CAN'T FILL ANYTHING WITH "fire" (A CONTAVISH), " 'cause it'll burn." In sentence 2 of this series, the child fits "gas and fire: The more 'gas' you take out of the 'fire' the larger it gets" (the more gas you have). The over-all solution which is used for all the sentences in this series is "gas and fire."

B.A. (9-10) employs "hole" for sentence 1 of series III: YOU CAN'T FILL ANYTHING WITH A "hole." The solution offered for sentence 3 is "beams." BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE "beams." The over-all solution is "hole and beam." In sentence 1, "You can't fill a 'hole' with a 'beam,' 'cause a 'beam' isn't round like a 'hole' so it can't fill it up."

F.V. (9-11) presents the solution "fix" in sentence 3 of series II: JANE HAD TO "fix" THE CLOTH SO THE DRESS WOULD FIT MARY. "Hurry" is used for sentence 5: "To 'hurry' the children so they can get some seats there must be enough chairs." The over-all solution is "fix and hurry." In sentence 3, "Jane had to 'fix' the cloth so that the dress would fit Mary who was in a 'hurry' to go out."

Similarly this child uses "no nerve" as the over-all solution for series V. For instance, sentence 4: THE WAY IS CLEAR IF THERE ARE NO "no nerves" (ASHDERS), (i.e., if you have the nerve to do a job); sentence 5: "He had 'no nerve' to get rid of a few 'ashders'." Thus the solution consists of a combination of "no nerves" and "ashder" (an areferential word).

J.P. (10-0) finds the solution "bad" for sentence 1 of series VI: THE DINNER WAS GOOD BUT THE FRUIT WE ATE

WAS "bad" (SOLDEVE). For sentence 3 of this series the solution given is "go out with girls": THE OLDER YOU GET THE SOONER YOU WILL BEGIN TO "go out with girls" (SOLDEVE). The over-all solution, "go out with girls and bad" is fit into sentence 1: "When I 'went out with a girl' the dinner was good but the fruit we ate was 'bad'."

b. Aggregation of solutions by causal relationship. Here, two solutions, A and B, are combined by causally relating A to B. The following serve to illustrate:

D.J. (10-5) offers "things he doesn't give away" for sentence 2 of series IX: "People who have 'things they don't give away' are not well liked." He supplies "nuisance" as the solution for sentence 3 of this series. THE PLAN TO BUILD THE HOUSE WAS A "nuisance" BECAUSE IT COST TOO MUCH. The over-all solution is "nuisance and things he doesn't give away." He fits it into sentence 2: "A person is a 'nuisance' because 'he doesn't give things away'."

J.P. (10-0) uses "active" as the solution for sentence 1 of series II: IF YOU EAT WELL AND SLEEP WELL YOU WILL "be 'active'" (HUDRAY). "Wash" is offered as solution for sentence 2. MRS. SMITH WANTED TO "wash" HER FAMILY. The over-all solution presented is "active and wash" which is applied to sentence 1, "An 'active' boy when he comes in he's sweating so he gets 'washed'."

c. *Aggregation of solutions by juxtaposition.* Two solutions, A and B, are combined by being placed side by side without further specifically relating them. The following examples illustrate such aggregation:

H.R. (9-3) presents the solution "gay" for sentence 1 of series XII: "When you are 'gay' it keeps you from being unhappy." His solution for sentence 2 is "get": "If you 'get' a good mark you should try to keep it up." His over-all solution is "gay and get." It is fit into sentence 2 in this manner: "If you are 'gay' and you 'get' a good mark you should try to keep it up."

C.E. (10-0) supplies the solution "bumpy" to sentence 2 of series VI: WHEN WE WERE DRIVING IN THE EVENING WE DID NOT FEEL SAFE BECAUSE "the road seemed to be 'bumpy'." In sentence 6 the solution offered is "bigger": "Well, when the windows were frozen so things looked 'bigger' (when you look through water everything looks 'bigger')." The over-all solution "bumpy and bigger" is fit into sentence 2: "When they were driving everything looked 'bigger' and it was so 'bumpy' there."

J.H. (10-0) presents the solution "concentrate" for sentence 1 in series II: IF YOU EAT WELL AND SLEEP WELL YOU WILL "concentrate." For sentence 3 of this series the offered solution is "mend." JANE HAD TO "mend" THE CLOTH SO THAT THE DRESS WOULD FIT MARY. The over-all solution is "concentrate and mend." It is fit into sentence 1: IF YOU EAT WELL AND SLEEP WELL YOU WILL "be able to 'concentrate' and 'mend'."

d. *Syncretic fusion of solutions.* Two solutions, A and B, are combined by syncretically fusing them into one. The term syncresis indicates the complete fusion of two meanings into one functional meaning sphere. Thus, for instance, in the following example "mother" and "accident" are in effect functionally the same.

J.D.T. (11-4) uses "mother" as the solution for sentence 2 of series V: "Mother" KEEPS YOU FROM DOING WHAT YOU WANT TO DO. The solution "accident" is supplied for sentence 4: THE WAY IS CLEAR IF THERE ARE NO "accidents." The over-all solution becomes "accident and mother." It is applied to sentence 2: "An 'accident' sometimes keeps you from doing what you want to do; when your 'mother' hears about it she won't let you go." For this child "accident" and "mother" are both inhibiting factors.

C.D'A. (8-11) furnishes a response very similar to the above illustration. For sentence 2 of series V she offers the solution "mother": "Mother" KEEPS YOU FROM DOING WHAT YOU WANT TO DO. Her solution for sentence 4 is "fog": THE WAY IS CLEAR IF THERE IS NO "fog." Her over-all solution is "mother and fog." Thus sentence 2 reads: "'Mother' keeps you from going out when there is a 'fog'." Again it is both "mother" and "fog" that are considered the inhibiting factors.

e. *Aggregation of more than two solutions.* In a number of instances more than two word meanings are combined into one over-all solution.

N.F. (9-0) supplies two solutions for sentence 5 of series III: A "bottle" HAS ONLY ONE "nipple." His solution for sentence 6 of this series is "water": JOHN FELL INTO "water" IN THE ROAD. His over-all solution is "nipple, bottle and water." The over-all solution is fit into sentence 5 as follows: "Yeah, you fill up the 'bottle' with 'water,' then you put the 'nipple' on and the baby drinks the 'water'."

J.P. (10-0) fits three solutions, "go out with girls," "plant that hasn't blossomed" (flowers) and "pink" into series VI,

sentences 3, 4, and 5 respectively. Sentence 3: THE OLDER YOU GET THE SOONER YOU WILL BEGIN TO "go out with girls." Sentence 4: PEOPLE LIKE A BLOSSOMING PLANT BETTER THAN "a plant that hasn't blossomed." Sentence 5: PUTTING THE DRESS ON THE SUNNY LAWN MADE THE COLOR OF THE CLOTH "pink (it faded pink)." The over-all solution is: "go out with girls, flowers, and pink." It is fit into sentence 3 as follows: "The older you get, the more 'flowers' you're going to have to get for your 'girl when you go out with her' and girls prefer 'pink' flowers."

2. *Pluralization*

Another form of signification based on word-sentence embeddedness, but much less primitive than aggregation of solutions, is pluralization. It again is an attempt to integrate several meanings of a word of which each is so specifically embedded that it cannot be lifted out of its context and placed into other sentences. The plural concept that is evolved under these circumstances has two main characteristics: one, it is a concept that is in a vague way common to the specific word meanings that fit the various test sentences; two, the individual word meanings are so specifically a part of each of the sentences, and the over-all concept so general that the latter cannot replace the single solutions. The common concept becomes *pluralized* in order to fit into the various sentences.

For instance, a child uses a particular concept for individual sentences of series VIII. Such solutions as "hit back," "holler," "lie" individually fit. The child indicates as the over-all solution "respect your elders." Actually "respect your elders" is not suitable as the over-all solution insofar as it is inapplicable for the individual sentences. The individual solutions for the sentences are retained in addition to the over-all concept. Thus the child states "prignatus means 'respect your elders'" and then continues: "it fits because in sentence 1 'hit back' fits and in sentence 2 'lie' fits and in sentence 3 'holler' fits."

The much greater primitivity of conceptual aggregation compared with pluralization can be seen from the way the over-all concept is formed. The plural concept is a vague class name of the specific solutions, whereas the aggregative concept lacks classificatory activity; it simply combines concretely or fuses the various specific solutions.

On the other hand, pluralization is genetically inferior to generalization. An example may illustrate pluralization in contrast to generalization proper:

Generalization:

VIII. 1. BOYS SOMETIMES "lie to" THEIR PARENTS.

VIII. 2. MARY DID NOT KNOW THAT JANE USED TO "cheat."

"lie" "cheat"

"deceive"

VIII. 4. YOU MAY "deceive" SOMEONE BUT YOU WILL NOT GET AWAY WITH IT OFTEN.

Over-all solution — "deceive"

Pluralization:

VIII. 1. BOYS SOMETIMES "hit back" THEIR PARENTS.

VIII. 2. MARY DID NOT KNOW THAT JANE USED TO "lie."

VIII. 3. MOTHER SAID, JIMMY YOU SHOULD NEVER "holler at" YOUR OWN MOTHER.

Over-all solution — "not respect your elders."

In the case of generalization the child having arrived at the solution "deceive" proceeds to fit it into the preceding sentences, whereas in the case of pluralization there is no attempt to fit the over-all solution, "respect your elders" directly into the preceding sentences. Between the two processes there is a difference in the relationship of the specific solutions to the over-all concept. We might diagrammatically present the differences by Figure 1.

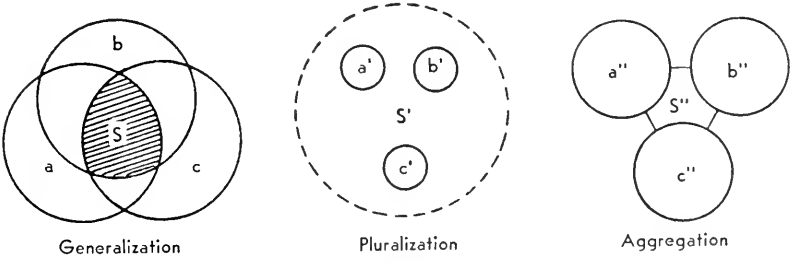


Figure 1. Three Forms of Signification

The truly general meaning of PRIGNATUS is represented as the common denominator of the transitional concepts a, b, c, by the shaded area S of the left figure. S of the middle figure symbolizes the general meaning sphere of concrete concepts a, b, c, solidly embedded in the three sentences. To show the intermediate position of pluralization between generalization and aggregation the right hand diagram has been added: here, a class sphere common to a, b, c, is lacking.

The following examples illustrate the variety of pluralization processes. Most typical are those cases where the multiplicity of concrete word meanings, individually fitting a sentence, are bound together by an implicit common concept which is too vague to be applied to the individual sentences:

L.W. (9-11) uses the concepts, "feed," "fix dress," "fit library," for the various sentences of series II: sentence 2: MRS. SMITH WANTED TO "feed" HER FAMILY; sentence 3: "Jane 'fixes the dress' so it will fit Mary"; sentence 6: YOU NEED ENOUGH SPACE IN THE BOOKCASE TO "fit the library." The child states that HUDRAY means "working" but does not apply "working" to the individual sentences.

J.P. (10-0) offers individual solutions, "dripple glass" and "jack-in-the-box" respectively for sentences 1 and 2 of series III: sentence 1: "You can't fill up a 'dripple glass' because the water will leak out and everything"; and sentence 2 reads: "When you take the 'jack-in-the-box' out of the box, it gets bigger, it stretches." This child arrives at the over-all solution "plaything," that in itself is too vague to be applied to the sentences.

W.P. (10-6) presents specific solutions "work it out" and "paint" for sentences 5 and 6 of series V: for sentence 5: BEFORE FINISHING THE TASK HE HAD TO "work it out"; sentence 6: JANE HAD TO TURN BACK BECAUSE THERE WAS "paint" IN THE PATH. A vague over-all solution, "do" (not applicable to the sentences) is offered.

J.F. (9-4) supplies "give family something to eat" as a solution for sentence 2 of series III; "iron the cloth" as solution for sentence 3, and "put books into shelf" for sentence 6. "Do things" is presented as the over-all solution though it is not applicable to the individual sentences.

3. *Transposition*

Akin to the process of pluralization is what we have termed transposition. Here, as in pluralization, the child has an over-all concept which as such does not fit the individual sentences; therefore, he retains the individual solutions. In both processes the over-all concept is made to fit the sentences through the mediation of specific concepts. In pluralization the vague over-all concept S is made to fit the individual sentences through the use of specific solutions, with S as the implicit common denominator. In transposition the over-all concept S is originally a concept A formed for an individual sentence. It fits the other individual sentences through the use of specific solutions (B, C) which are equated more or less arbitrarily with the original so-

lution by means of expressions such as, "like-a," "kind-a," "sort-a."

A few examples may serve to illustrate:

R.W. (10-4) obtains "dirty" (original concept) in sentence 1 of series VI: THE DINNER WAS GOOD BUT THE FRUIT WE ATE WAS "dirty" (SOLDEVE). The response to sentence 5 of this series is: PUTTING THE DRESS ON THE SUNNY LAWN MADE THE COLOR OF THE CLOTH "burnt," "the sun burnt a little hole in it, 'burnt' is 'dirty-like'."

G.D. (9-3) offers "teacher" as solution for sentence 2 of series V: "A teacher" KEEPS YOU FROM DOING WHAT YOU WANT TO DO. ("When you want to do something you can't because it's the rule of the 'teacher'.") " 'Teacher' fits sentence 1 because let's say the 'boss' tells you to do something else—he bosses you around—well the owner of the store is sort-a, like-a 'teacher,' right? The owner in the store bosses the people around—so 'teacher' fits."

L.P. (11-3), original concept "leader" is fit in sentence 2 of series XI as follows: IF YOU BELIEVE IN "God" YOU ARE A GOOD PERSON, "well 'God' is like a 'leader'—it fits."

G.B. (11-8) employs "bar" in sentence 2 of series I: A "bar" MAY BE USED TO CLOSE OFF AN OPEN PLACE. Coming back to sentence 1, he says: "leg of a table" MAY BE USED FOR SUPPORT, " 'bar' fits—'a leg of a table' is a sort-a 'bar'."

C. Statistical Analysis: Word-Sentence Fusion and Word-Embeddedness

The statistical analysis is concerned with the developmental changes of processes that occur with increase of age. The two main measures employed are (1) the mean number of occurrences of a particular process for an age group, and (2) the percentage of children in an age group evidencing that process.

Analysis of variance (F Test) and Fisher's "t-test" were employed for the determination of variability and the significance of differences.

In the qualitative analysis we have distinguished various immature processes based on undifferentiated word-sentence relationships. The statistical analysis pertains to the individual processes as well as to combinations of psychologically allied processes. Since we are dealing with immature processes of signification, one would expect that these processes are most prevalent with the younger children and generally decrease with increasing age. However, stating changes simply in terms of a general decrease does not present the entire developmental pic-

TABLE III

PROCESSES BASED ON A LACK OF DIFFERENTIATION BETWEEN WORD AND SENTENCE: MEAN FREQUENCY

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Sentence-Core	2.76	1.00	0.24	0.00	0.08	*I/II*, II/IV
2. Assimilation	3.48	3.28	0.44	0.04	0.00	II/III
Sum 1+2	6.24	4.28	0.68	0.04	0.08	II/III
3. Gradient	4.52	3.12	0.60	0.04	0.24	*II/III*
Sum 1+2+3	10.76	7.40	1.28	0.08	0.32	*II/III*
4. Aggregate of Solutions	1.16	1.84	0.52	0.16	0.20	I/IV, *II/III*
5. Pluralization	0.88	1.72	0.56	0.96	0.44	—
6. Transposition	0.04	0.16	0.12	0.20	0.00	—

* Italics indicate differences between the means significant at the .01 level of confidence; all other differences noted are significant at the .05 level.

TABLE IV

PROCESSES BASED ON A LACK OF DIFFERENTIATION BETWEEN WORD AND SENTENCE: PER CENT OF SUBJECTS SHOWING PROCESSES

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Sentence-Core	56	44	16	0	8	II/III, III/IV
2. Assimilation	64	28	16	4	0	I/II
Sum 1+2	76	48	20	4	8	I/II, II/III
3. Gradients	84	80	40	4	24	II/III, *III/IV*
Sum 1+2+3	96	80	52	8	32	II/III, III/IV
4. Aggregate of Solutions	56	60	28	12	20	II/III
5. Pluralization	24	36	16	28	20	—
6. Transposition	4	12	8	16	0	—

* Italics indicate differences between per cents significant at the .01 level of confidence; all other differences noted are significant at the .05 level.

ture. A more comprehensive study of the genetic trends requires a comparison of the changes that take place between age groups in regard to amount and significance. Since it can be assumed that the various processes differ in degree of immaturity, one might reasonably expect these differences to be reflected in the shape of the developmental curves of the various processes.

Tables III and IV summarize the main results with regard to immature processes based on word-sentence fusion and embeddedness.

In our analysis we calculated separately those core-concepts which were developed for individual sentences and those which were applied to several sentences through assimilation of sentence meaning (cf. p. 49).

Among the processes indicating *word-sentence fusion,* the sentence core concept developed for individual sentences shows the earliest significant drop in occurence. There is a decrease from 2.76 (mean occurrence) at age group I to 1.00 at age group II, with practically no occurrence thereafter. The percentage of the children participating in this process decreases slightly from the first to the second age group, and sharply to the next, with only 16 per cent of the children in age group III showing traces of the process. These data indicate that sentence-core conceptualization pertaining to single sentences is characteristic only of the youngest age groups.

To calculate all the instances where core-conceptualization occurs we combined the figures for individual sentence core-concepts and core-concepts participating in assimilation. The occurrence of these two forms decreases very rapidly between the first to third age groups (6.24 to 0.68). After the third age group they have practically disappeared. The developmental trend is similar with regard to the percentage of children evidencing these processes.

The holophrastic gradient decreases significantly between the first three levels with little occurrence thereafter. We may note that with the first two age groups a great majority of children show these processes with sharp significant decreases between the second, third and fourth age groups.

Comparing the three processes of word-sentence fusion with each other, one observes that sentence-core concepts already decline in mean frequency significantly between the first two levels, whereas the other two processes decrease significantly from age group II to III. This suggests a relatively greater primitivity of sentence-core concepts. This difference in rate

of decline is probably due to the fact that assimilation and gradient are primitive attempts toward integrating several solutions, whereas such attempts are lacking in the formation of sentence-core concepts that involve only single sentences. Combining, furthermore, all responses that deal with sentence-word fusion (S-Core + Ass. + Gradient) one finds a decrease, though not significant, in mean occurrence between the first two

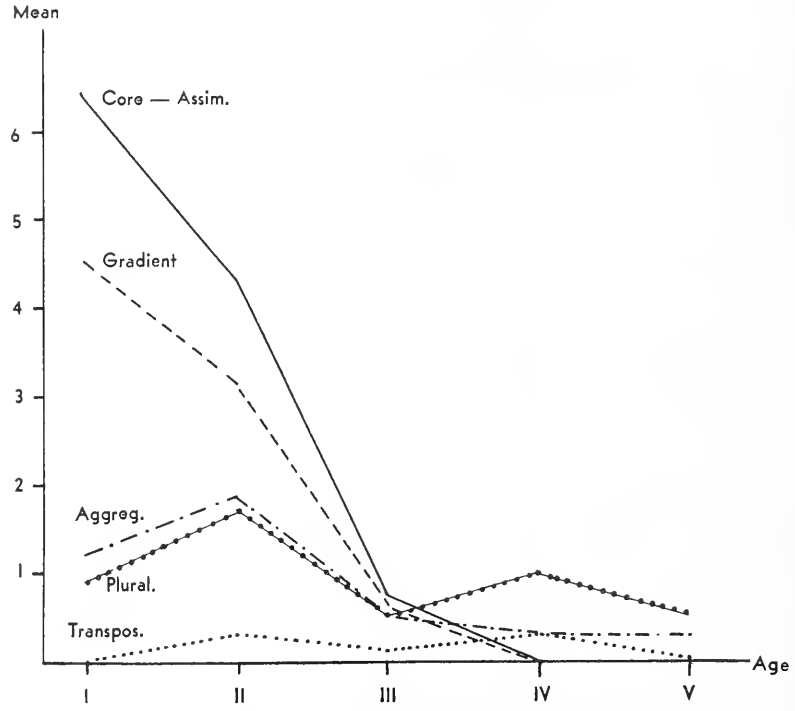


Figure 2. Processes based on Word-Sentence Fusion and Embeddedness

age groups, and a sharp and significant decline between the second and third age groups. With the older children there is practically no occurrence of these processes.

The statistical analysis of the responses indicating *word-embeddedness* (aggregation, pluralization, and transposition) show the following trends:

Aggregation of individual solutions increases insignificantly in occurrence from age group I to age group II but sharply and significantly declines between the second and third age groups. Pluralization as well as transposition also insignificantly increases from the first to the second age group, oscillating downward from there on. The almost complete disappearance

of aggregative concepts at age group IV, as contrasted with the oscillating frequency of plural concepts, points to the greater primitivity of aggregation.

An inspection of Figure 2 brings into relief the difference between processes based on word-sentence fusion as compared with those based on embeddedness. The graph depicting the early decline of word-sentence fusion indicates the genetically low order of these processes. Among the processes of word-sentence embeddedness aggregate concepts appear more primitive than plural concepts.

The inference drawn from these data is that word-sentence fusion, and to a lesser extent conceptual aggregation, are more characteristic of the younger age groups than pluralization and transposition. This inference is in agreement with theory and psychological observation: firstly, in core conceptualization and gradient formation the word-sentence relationship is undifferentiated to a higher degree than in word-embeddedness. Secondly, whereas attempts toward integration within the first group of processes are of a primitive, viz., preclassificatory nature—(aggregation of concepts, assimilation of sentence meanings)—the attempt at integration through pluralization and transposition presents an intermediate stage which is a precursor of true subsumptive generalization (as will be discussed in section III, p. 107).

D. Formation of Word Meanings Relatively Differentiated from Sentence Context

The previous section was concerned with analysis of the processes of signification that involve concepts so intimately fused with, or embedded in, the sentence that they cannot be treated as separate entities. Other forms of immature signification involve *holophrastic, syncretic,* and *fluidic* concepts not demonstrating such intimate linkage of word and sentence.

1. *Nonsentential Holophrastic Concepts*

Between the holophrastic concepts discussed in this section and the holophrastic sentence-core concepts, there is this main difference: the context of the sentence-core concept is identical with that of the test sentence, whereas the nonsentential holophrastic concept refers to a situation not directly represented by the sentence. There are several forms of signification involving holophrastic comprehension of word meanings which are quite common in our protocols, viz., *simple holophrasis, synecdoche, holophrastic concretization, juxtaposition,* and *chain.*

a. *Simple holophrasis, implicit and explicit.* The holophrastic nature of a word meaning may not always be immediately apparent. The child may use a seemingly circumscribed word which in the course of probing is found to have a total situational referent (implicit holophrasis). In other cases the child verbally expresses the holophrastic meaning by explicitly stating a solution not in terms of a word but by a phrase depicting a more or less comprehensive situation.

Implicit holophrastic meanings of words may be illustrated by a few examples:

A.P. (11-2) uses the solution "want" for sentence 1 of series XII: "Want" KEEPS US FROM BEING UNHAPPY. It became apparent that what the child meant by "want" was the following: " 'If you want a bow and arrow set and you get it' that keeps you from being unhappy."

N.F. (9-0) for the same sentence derives the solution "mother," meaning by that word: "Mother when she gives you things that you want" KEEPS YOU FROM BEING UNHAPPY.

D.J. (10-5) uses the solution "insects" in sentence 2 of series V: " 'Insects' keep you from doing what you want to do with the wood." By "insects" the child means: "Insects that are eating the wood."

Explicit holophrastic meanings of words are indicated by phrases rather than by single words. However, the use of a phrase that replaces the unknown word is not necessarily indicative of holophrastic conceptualization. Often because of the child's limited vocabulary a phrase is used which simply serves the function of describing the concept for which the word is lacking. For instance, several children lacking as solution for series V the word "obstacle," consequently used such descriptive phrases as "something that's in your way," "something that doesn't let you go by," i.e., phrases which do not denote global situations but are simply substitutes for a delimited concept. The true holophrastic expressions are not substitutes for delimited concepts, but represent global situations as illustrated by the following examples:

C.E. (10-0) signifies LIDBER in sentence 1 of series X as follows: ALL THE CHILDREN WILL "sing happy birthday" AT MARY'S PARTY.

R.W. (10-4) reads sentence 4 of series V as follows: THE WAY IS CLEAR IF THERE ARE NO "parts" (of a radio) "that don't fit in right." The child refers to a radio repair situation.

L.P. (9-5) responds to sentence 3 of series X: "The people 'admired about how nice he speaked' when the speaker finished his talk."

J.D.F. (11-1) completes sentence 2 of series X as follows: THE POLICE DID NOT ALLOW THE PEOPLE TO "throw papers" ON THE STREET ("because we want to keep the city clean").

b. *Synecdochic processes.* Here, either a part of a global situation may be used for the whole or the whole used for the part. To illustrate:

J.Z. (9-6) offers "plant" as the solution for CONTAVISH in series III. It becomes clear in the course of the test that the child refers to plant as "a flower pot containing dirt and things grow out of it." In the attempt to fit the concept "plant" into the various sentences she uses parts of this global constellation. In sentence 2, for instance, she states: "The more 'dirt' you take out of the inside of the plant the larger the 'plant' gets (more room in the pot)." In this sentence "plant" means not the whole but only a part of the constellation, viz., "pot."

c. *Holophrastic concretization.* In order to make an already formed concept fit the requirements set by the cues of a new sentence, the child may concretize the original meaning by appending specific situational elements. Such concretization may involve linguistic additions ranging from small verbal units to whole phrases. The following three examples illustrate the concretization of an already formed concept through the addition of a qualifying term:

P.P. (9-4) offers "brains" as solution in sentence 3 of series VII: IF YOU HAVE DONE SOMETHING WRONG AND YOU ARE NOT AFRAID TO TELL THE TRUTH YOU HAVE "brains" (SACKOY). The child concretizes the concept "brains" to "nice brains" to fit sentence 1: WE ALL ADMIRE PEOPLE WHO HAVE "nice brains."

L.F. (8-10) concretizes his original concept "safety" in sentence 6 of series XI to "safety rules" in sentence 1.

P.P. (9-4) offers as solution for sentence 2 of series XII "earn"; this is concretized in sentence 1 to "earn money."

In other instances concretization involves qualifiers referring to comprehensive situations:

J.B. (10-0) forms the concept "long" that is concretized in sentence 3 of series VI: THE OLDER YOU GET THE SOONER YOU WILL BEGIN TO "get long hair."

This child, for series II uses originally the concept "books" which is concretized in sentence 2: "throwing books at her family."

S.G. (10-6) uses the concept "hope" in sentence 3 of series XII: WE "hope" GOOD THINGS HAPPEN TO US. "Hope" is concretized to: "hope you get enough money to make up for the money you spend."

Holophrastic concretization occurs most easily and frequently when there is an original concept which is very general and vague, such as "have," "be," "get," "fix."

N.F. (9-0)—Sentence 6 of series X: JIMMY "got" (LIDBERED) STAMPS FROM ALL COUNTRIES. The concept "get" is concretized in sentence 1 of series X: "Mary's mother is going to 'get a cake', " and in sentence 2: "The policeman told you to 'get back' on the sidewalk."

M.B. (9-8) concretizes the original concept of "fix" in many ways, e.g., in sentence 3 of series II: MARY "fixes" (or repairs) "the cloth"; in sentence 2: Mrs. Smith "fixes" (or prepares) "the dinner."

It might be added that holophrastic concretization appears in many instances to be related to pluralization discussed above. In such cases the child selects a broad nuclear concept as an over-all solution which is holophrastically concretized in a number of ways in order to specifically fit the individual sentences. For example:

L.A. (10-0) obtains the nuclear concept, "take in," in sentence 3 of series II: JANE HAD TO "take in" THE CLOTH SO THAT THE DRESS WOULD FIT MARY; it is concretized in sentence 2: MRS. SMITH WANTED TO "take in the house" HER FAMILY; it is concretized again in sentence 1: IF YOU EAT WELL AND SLEEP WELL YOU WILL "take in a lot of rest."

J.Z. (9-6)—The nuclear concept is "collect" in sentence 1 of series X: ALL THE CHILDREN WILL "collect ribbon and stamps" AT MARY'S PARTY. It is concretized in sentence 3: " 'collect autographs' from the speaker," and in sentence 4: "when there is an accident the reporters quickly 'collect information' from the police—so they will be the first to have it in their paper."

B.S. (9-6)—In series V a nuclear concept "man" is concretized in sentence 1 to "another man": A LAZY MAN STOPS WORKING WHEN THERE IS "another man—he would stop and make that man do the work"; it is concretized in sentence 3 to "men working": MR. BROWN SAID TO MR. SMITH I DON'T THINK WE SHOULD START WITH THIS WORK BECAUSE THERE ARE "men working"; in sentence 5 it is concretized to "man throwing banana peels": BEFORE FINISHING THE TASK HE

HAD TO GET RID OF " 'the man throwing banana peels' before people fall and sue the company."

d. The holophrastic apprehension of word meanings may lead to what we have termed *signification by juxtaposition* and *signification by chain.* In the process of juxtaposition the child, after having formed a concept A for one sentence, may retain this concept as the solution for a new sentence if a specific solution B, directly fitting this new sentence is spatially contiguous with concept A. For example:

S.S. (12-0) finds the meaning "rope" for CORPLUM in the first sentence: "A rope" MAY BE USED FOR SUPPORT ("you can hang on to it"). "Rope" fits into the second sentence: "Rope" MAY BE USED TO CLOSE OFF AN OPEN PLACE ("in a cave you can pull a 'rock' into the cave with a 'rope'—the rock would shut the cave off"). Though the immediate concept is "rock" (concept B) it is "rope" (concept A) which the child uses as the solution.

B.B. (9-3) has as a primary solution "board." In sentence 6 of series V the immediate concept "sign" is contiguous with the primary solution: JANE HAD TO TURN BACK BECAUSE THERE WAS "a 'board' with a 'sign' on it that said: Go Back."

L.B. (10-1) offers "plaster" as the primary solution for series III. The child read sentence 5 as: A BOTTLE HAS ONLY ONE "label," explaining, "you use 'plaster' to put on the 'label'." Thus by contiguity "plaster" can be retained as the solution.

We might add that juxtaposition as defined here does not entail an unrelated side-by-side placement; each of the two juxtaposed elements may be assumed to represent a total situation of which they are both a part. Thus signification by juxtaposition is most likely a consequence of holophrastic, synecdochic conceptualization.

In signification by chain a similar mechanism seems to be operative. Here, two objects, instead of being connected in terms of spatial contiguity, as is the case in juxtaposition, are temporally related to each other, e.g., in terms of cause and effect. For example:

R.F. (12-0) offers "honor" as the over-all solution for series VII: WE ALL ADMIRE PEOPLE WHO HAVE MUCH "honor," etc. In sentence 6, the child uses "guts": YOU NEED "guts" TO FIGHT WITH A BOY BIGGER THAN YOU; " 'honor' fits because if you have 'guts' you are honored aren't you?"

B.S. (9-6) uses "die" as solution for series VI; in sentence 3: THE OLDER YOU GET THE SOONER YOU WILL BEGIN

TO "die." "Die" fits sentence 2 on the basis of the causal relationship "die"—"fall down": WHEN WE WERE DRIVING IN THE EVENING WE DID NOT FEEL SAFE BECAUSE "trees on the road 'fell down' (after they 'died')."

J.F. (8-9) uses "tin" as the solution for series I and fits it in sentence 1 through the intermediate concept "money: when you sell the 'tin' you get 'money' and 'money' can be used for support."

2. *Syncretic Concepts*

Word syncresis is another expression of undifferentiatedness of meaning. Word syncresis refers to a fusion of qualities which, in mature thought, are discrete and incongruous. The child may, for instance, interchangeably denote by the same word the subjective and objective aspects of the situation; he may express active as well as passive qualities by one verb form; or he may use a word in its positive as well as negative sense (A and Not-A). In most instances of this sort our children did not seem to mind the incongruity or even the contradiction in the meanings they gave for the artificial word in the various sentences. Illustrations of word usage reflecting the interchangeability of the subjective and objective aspects of a situation are the following:

E.K. (10-9) employs as the meaning of ASHDER (series V) "fire" as well as "fire bug" (man making fires). Sentence 1: A LAZY MAN STOPS WORKING WHEN THERE "is a 'fire'." Sentence 4: THE WAY IS CLEAR IF THERE ARE NO " 'fire bugs'—no man that will set fire to buildings."

J.F. (9-4) employs both "container" and "contained matter" as solution in series III. Sentence 2: THE MORE YOU TAKE OUT OF A "container" THE LARGER (the roomier) IT GETS. Sentence 5: A BOTTLE HAS ONLY ONE " 'thing in it'—so contavish means the things in the container."

C.L. (8-11) reads sentence 2 of series VI: WHEN WE WERE DRIVING IN THE EVENING WE DID NOT FEEL SAFE BECAUSE THINGS ON THE ROAD "looked funny—so I said 'I feel funny'." Being "funny" is applied to the road as well as to the person riding on the road.

These are examples where the same word denotes in successive sentences an active or passive relationship:

C.E. (10-0) uses "ignore" as solution for series VIII in the active as well as the passive sense: BOYS SOMETIMES "ignore" THEIR PARENTS. A GOOD MAN WHO TELLS THE

TRUTH WILL NEVER "be ignored (people will always listen to him").

Similarly: "like people" and "liked by people" are interchangeably used: IF YOU BELIEVE IN "liking people" YOU ARE A GOOD PERSON "and you should be kind to other people so that you will 'be liked' by other people."

J.H. (10-0) uses "to love and be loved" interchangeably in series VII. Sentence 1: WE ALL ADMIRE PEOPLE WHO HAVE MUCH " 'love' for other people." Sentence 4: A PERSON WHO SAVES A BABY FROM DROWNING "is 'much loved' by other people."

Related to the aforementioned form of syncresis is the "reciprocal" usage of action verbs. This concerns verbs which in advanced language usage are employed one-directionally—either from subject to object or from object to subject. Such verbs as teach—learn, sell—buy, and lend—borrow have reciprocal connotation. The child may use one member of these pairs in both directions (as do uneducated adults).

Many of our young children apply solutions reciprocally. For instance, the solution "learn" in series II—YOU "learn" WHAT YOU KNOW BY READING AND STUDYING—is frequently fit into sentence 2 as follows: MRS. SMITH WANTED TO "learn" HER FAMILY.

J.Z. (9-6)—In sentence 5 of series VIII "talk back to" is offered as solution: A GOOD MAN WHO TELLS THE TRUTH WILL NEVER "talk back to" YOU—"a good man tells the truth and no one will 'talk back to' him."

In many cases of syncretic signification holophrastic comprehension is also involved. Thus, frequently, the interchange of the subjective and the objective, or the passive and the active view of a situation may be possible because of a global comprehension. The emphasis upon the global qualities of a context is likely to preclude succinct relationships between elements. Consequently shifts in relationship, e.g., from active to passive, subjective to objective, may go unnoticed. The following example may serve to clarify this point:

A.H. (10-0)—Sentence 3 of series II: JANE HAD TO "shorten" (HUDRAY) THE CLOTH SO THAT THE DRESS WOULD FIT MARY—"she had to cut the dress shorter and Mary had to eat less and get thinner."

Here the general idea of "reduction" pervades the whole situation encompassing "dress" and "Mary." The shift from the reduction of the dress to "reducing Mary" leaves the global situation unaltered.

3. *Fluid Modification*

Another characteristic of immature signification is instability of word meaning. Instability plays a role in practically all the signification processes discussed before. However, it should be noted, that instability is not necessarily coexistent with either holophrasis or syncresis; it can occur apart from them. After having formed a concept in one sentence the child may vary its meaning for the purpose of fitting it into another sentence. Such semantic variation, which does not involve holophrastic or syncretic conceptualization, we have termed *modification*. Among the modifications of word meaning the most prevalent forms are those involving homonymous words and metaphorical expressions.

The homonymy of English words (including colloquialisms) is utilized in the following examples of modifications:

A.H. (10-0) offers "get light" as the initial solution in series VI, sentence 5: PUTTING THE DRESS ON THE SUNNY LAWN MADE THE COLOR OF THE CLOTH "get light." "Light" fits sentence 1: THE DINNER WAS GOOD BUT THE FRUIT WE ATE WAS "light—it could be 'light' fruit you know like you eat a 'light' meal."

The same child has the solution "plant" for sentence 5 of series X: THE MORE FLOWERS YOU "plant" THE MORE YOU WILL HAVE. "Plant" fits sentence 2: THE POLICE DID NOT ALLOW THE PEOPLE TO "plant themselves" ON THE STREET.

Later on the child offers the solution "save" for sentence 6 of the same series: JIMMY "saved" (kept) STAMPS FROM ALL THE COUNTRIES. "Save" takes on the attribute of "rescue" in sentence 4: "They 'save' the person when there is an accident."

S.G. (10-6) obtains the solution "bright" in sentence 4 of series II: "You are 'bright' when you read and study." "Bright" is altered in sentence 6 to mean: " 'bright, in the sense of cheerful'—if you have enough space for your books in the bookcase it will look 'bright,' you know what I mean—even and cheery."

Examples of quasi-metaphorical usage in modification are the following:

G.D. (9-3) has the solution "sickness" for series IX, BORDICK. "Sickness" fits sentence 3 (THE PLAN TO BUILD THE HOUSE WAS A BORDICK BECAUSE IT COST TOO MUCH) in this manner: "If the house is 'sick' it gets a lot of holes and it costs a lot of money to fix it."

J.H. (10-0) fits the concept "dim" in sentence 5 of series VI: PUTTING THE DRESS ON THE SUNNY LAWN MADE THE COLOR OF THE CLOTH "dim" (SOLDEVE). It fits sentence 2: WHEN WE WERE DRIVING IN THE EVENING WE DID NOT FEEL SAFE BECAUSE "it was so 'dim'—it was scarey."

P.P. (9-4) fits "rotten" in sentence 1 of series VI: THE DINNER WAS GOOD BUT THE FRUIT WE ATE WAS "rotten" (SOLDEVE); and then in sentence 3: "when you get old doesn't your face get 'rotten'?"

B.S. (9-6) employs solution "die" in sentence 3 of series VI: THE OLDER YOU GET THE SOONER YOU WILL BEGIN TO "die." "Die" fits sentence 5: "The cloth 'dies' on the lawn 'cause people walk all over it and mud gets on it."

D.S. (11-7) offers "enemy" as solution for BORDICK in series IX. Sentence 5 reads: A PERSON HAS MANY "enemies" BECAUSE HE DOESN'T LISTEN TO WISE MEN. Returning to sentence 3, he states: THE PLAN TO BUILD THE HOUSE WAS "an enemy" BECAUSE IT COST TOO MUCH.

E. Nonsentential Holophrastic, Syncretic, Fluid Concepts: Statistical Analysis

As the qualitative analysis has shown, the children may employ concepts which, though not fused or embedded in the sentence, lack the semantic stability characteristic of mature concepts. We distinguished three types of such concepts lacking semantic stability; the nonsentential holophrastic, the syncretic and the fluidic.

The *holophrastic group* comprises the following forms: *simple word holophrasis, synecdoche, holophrastic concretization,* and *signification by chain* and *by juxtaposition.* The occurrence of these immature forms, as tables V and VI indicate, generally decreases as age increases. This decrease is apparent with respect to the mean occurrence as well as to the percentage of children. Simple word holophrasis, in particular, decreases considerably throughout the age levels: six and one-half simple holophrastic responses for age group I and only a little more than one such response given per child in the last age group. With respect to the number of children involved we find a decrease from 100 per cent to 64 per cent. This indicates that, though holophrastic responses are characteristic of the younger age groups, occasional occurrence is still evident with the majority of the older children. Holophrastic concretization shows a similar, though not as marked, decrease. Signification by chain and by juxtaposition decrease only slightly.

TABLE V

IMMATURE PROCESSES BASED ON A RELATIVE DIFFERENTIATION OF WORD FROM SENTENCE: MEAN FREQUENCY

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Simple Holophrasis	6.64	4.64	3.48	1.84	1.20	I/II, II/IV, III/V
2. Synecdoche	0.64	0.76	0.36	0.28	0.24	—
3. Holophastic Concretization	3.36	3.96	2.32	1.40	1.20	II/III
4. Chain and Juxtaposition	1.08	1.44	0.88	1.04	0.64	—
Sum 1+2+3+4	11.72	10.80	7.04	4.56	3.28	*II/III, III/IV*
5. Word Syncresis	1.08	1.48	0.72	0.52	0.44	I/V, II/III
6. Fluid Modification	3.04	2.76	3.76	2.20	1.96	III/IV

* Italics indicates differences between the means significant at the .01 level of confidence; all other differences noted are significant at the .05 level.

TABLE VI

IMMATURE PROCESSES BASED ON A RELATIVE DIFFERENTIATION OF WORD FROM SENTENCE: PER CENT OF SUBJECTS SHOWING PROCESSES

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Simple Holophrasis	100	88	88	72	64	I/II
2. Synecdoche	44	48	24	28	20	—
3. Holophastic Concretization	80	80	80	56	56	—
4. Chain and Juxtaposition	48	76	52	56	44	—
Sum 1+2+3+4	100	100	96	96	92	—
5. Word Syncresis	68	76	40	32	24	II/III
6. Fluid Modification	92	76	92	68	72	III/IV

* Differences noted are significant at the .05 level.

The holophrastic group as a whole (forms 1, 2, 3, 4 of Table V) shows a striking developmental decrease from 11.7 to 3.3 in mean occurrence. The data of Table VI reveal that practically all children participated in this decrease.

It is interesting to compare forms of holophrastic conceptualization that are based on word-sentence fusion with those which are relatively free from such fusion. Let us compare the sentence-core concept (Table III) with the simple holophrastic concept. In both cases there is a significant decrease in mean occurrence between the first two age groups and a drop between the second and third level which approaches significance ($P=.10$). However, the two developmental curves markedly differ from the third age group on. Whereas there is practically no incidence of the sentence-core concept at the third age level, the incidence of simple holophrastic concepts is still considerable (3.5 occurrences per child). The difference in the two developmental trends is also apparent from the percentages of children involved. Simple holophrasis extends to all levels. Even at the fourth and fifth level more than two thirds of the children still employ simple holophrastic concepts, whereas practically none of the older children use core concepts. The numerical results clearly indicate the greater primitivity of core conceptualization as compared with simple holophrastic concepts. Similar conclusions can be drawn from a comparison of all the holophrastic processes based on word-sentence fusion (core concepts, assimilation, and gradients) with holophrastic conceptualization relatively free from the sentence context. Tables III and V show a considerably greater, though insignificant, decrease of sentential versus nonsentential holophrasis between the first two age groups. In both cases there is a significant decrease between the second and third levels. Again, holophrastic processes indicating word sentence fusion show a much steeper decline and have practically disappeared at the fourth age group. One notes the more gradual decrease of nonsentential holophrastic processes with a mean of 3.3 occurrences per child still present at the fifth level. These data again reflect the greater primitivity of holophrastic processes based on word-sentence fusion.

Syncretic and *fluidic word meanings.* As is shown in Tables V and VI syncretic fusion of incompatible word meanings are low in occurrence. They are characteristic of the first and second age groups as is indicated by the fact that about 70 per cent of these younger children employ such word meanings. A significant drop, with respect to mean occurrence as well as percentage of children, occurs between the second and third levels

Fluidic modifications decrease slightly in occurrence throughout the age groups; there are no major over-all developmental changes in the frequency of these modifications.

If one compares those processes which are not holophrastic, namely the syncretic and the fluidic, one finds the following differences: word syncresis shows a significant developmental decline from the first to the fifth level, whereas fluidic modifications do not change in occurrence significantly. As to the percentage of children involved in the use of these two types of processes, one notices a considerable decrease of syncresis (from 68 per cent on the first level to 24 per cent on the last); but there is only a relatively slight decrease in the number of children who manifest fluidity in conceptualization (from 92 per cent on the first level to 72 per cent on the last). The conclusion can be drawn from these data that syncretic concepts are more characteristic of the younger children whereas fluid modification is still evident with the older age groups.

III. INTERPRETATION OF SENTENCES DURING SIGNIFICATION

Up to now our analysis has been focused on the unknown word and the various ways the child signifies it. The outstanding characteristics of immature conceptualization were found to be non-differentiation and instability of meaning. But signification is affected also by the way the child comprehends the sentence and the relation between word and sentence. In immature language behavior the above-mentioned characteristics pertain to the sentence as well as to the word. Because of sentence-word fusion, for instance, the meaning of the sentence is as much radically affected by the meaning of the word as is the word meaning affected by the meaning of the sentence. Thus the younger children having a preconceived word meaning will often alter the content of a test sentence with reference to it. Since the sentence is of low stability, its meaning can be manipulated for the purpose of applying a concept. Basically there are three ways of manipulating sentences: (1) In order to apply a concept to several sentences the child may *assimilate* the various sentence meanings, so that now identical, one concept can fit them all. (2) Fitting a concept into two or more sentences may be achieved by *sentence contamination.* The child transports parts of the sentence A for which the concept was initially formed into another sentence B. In this manner the concept originally fitting sentence A will also fit sentence B if the new context of this sentence is interpreted as A + B. (3) A third method of handling sentence meaning for fitting is *forced inter-*

pretation of a sentence which involves the addition of elements or the comprehension of the sentence content in a very concrete and singular way.

A. Assimilation of Sentence Meanings

We have already mentioned the process of assimilating sentence meanings in the section on core conceptualization. As a matter of fact, a core concept which is contextual in nature can apply to two or more sentences only if those sentences are interpreted as having an identical core of meaning. The following example illustrates interdependence of core-concept formation and assimilation.

The sentences involved are:

1. IF YOU EAT WELL AND SLEEP WELL YOU WILL HUDRAY.
2. MRS. SMITH WANTED TO HUDRAY HER FAMILY.
3. JANE HAD TO HUDRAY THE CLOTH SO THAT THE DRESS WOULD FIT MARY.
4. YOU HUDRAY WHAT YOU KNOW BY READING AND STUDYING.

The solution for HUDRAY in sentence 1 of series II is "healthy." In the second sentence the same solution appears. MRS. SMITH WANTED TO "keep 'healthy'" HER FAMILY. The response for sentence 3 is an "isolated" response—"sew." Sentence 4 is contextually conceived with a carrying over of the nuclear part of sentences 1 and 2, namely "healthy." The child says: "You are 'being healthy' by reading and studying health books and learning to do the right things." Now going back to the second sentence the child reports: "The second sentence has to do with 'health'." The second and the fourth sentences have similar meanings for the child. The child says: "Mrs. Smith wants her family to be 'healthy,' if you read books to teach you to be 'healthy' it has to do with the second sentence." The child explains further, referring obviously to the family situation of sentence 2 and associating it with sentence 4: "If a book says brush your teeth three times a day and you brush them only once you won't be healthy." Similarly with reference to sentence 1 the child says: "In a health book if it tells you to have twelve hours sleep and you have only seven hours you won't be as healthy as you are supposed to be." The contextual core concept which assimilates the three sentences is "health books." This example thus demonstrates how a child emerges with one sentence-core concept as the final solution by way of assimilating the various sentence meanings.

Another example of assimilative interpretation of sentences is the following:

J.S. (8-8) interprets most of the sentences of series II as dealing with "leaving enough space": after having arrived at the sixth sentence of series II — YOU MUST HAVE ENOUGH SPACE IN THE BOOKCASE TO HUDRAY YOUR LIBRARY— she makes this statement: "It means like space-like, you need enough room, I mean, all the sentences." She continues: "It fits in 1, you will have 'enough room' in your body. If you eat too much you get chubby, if you sleep a lot you get over-tired, that means if you do something too much then it's not good, so you leave 'space-like.' For sentence 2 it's the same thing, I mean as in 1, she wanted her family to leave 'enough space-like' in her house (she wanted them to leave room for some new furniture). In 3 she had to like lengthen the hem, leave the hem down so that it would be 'enough space' for Mary to fit into it. It doesn't fit 4, but in 5, you have to leave 'enough space' for the rest of the children so the rest will have chairs, you make space by two children sitting in the same seat."

B. Contamination of Sentence Meanings

There is a close relationship between the assimilation of word meanings and the fusion of the contextual meanings of sentences. In both instances, meanings of two or more contexts are united. In the case of assimilation this combination is in terms of complete identification, whereas in the case of contamination parts of one sentence are added to a second sentence. The relationship between assimilation and contamination of sentences is apparent in some of the protocols, e.g.:

N.F. (9-0) forms a core concept, "party," that fits all sentences in series X; but for such fitting the child finds it necessary to combine features of various sentences: Sentences 1 and 6—"Jimmy collected stamps from all the countries" (sent. 6) "and brang them to Mary at her 'party' " (sent. 1). Sentences 2 and 1: "The children were running to Mary's house to be in time for Mary's 'party' " (sent. 1) "and the police told them to stop" (sent. 2). Sentences 1, 2 and 3: "We children were going to the 'party' " (sent. 1) "and the policeman" (sent. 2) "was talking through the speaker" (sent. 3), "then they stopped." Sentences 1 and 4: "While the children were going to Mary's 'party' " (sent. 1) "an accident happened" (sent. 4) "and they went over there."

In this example all the sentences involve a common core, "Mary's party," to which features from the various sentences are added.

The attitude of the child toward sentence contamination is well expressed by D.W.'s (8-7) question: "Are you going to put all the sentences into one big sentence or put one sentence into another one?" This child proceeds to fuse features of the following sentences:

Sentence 5 of series VI: PUTTING THE DRESS ON THE SUNNY LAWN MADE THE COLOR OF THE CLOTH "bloomy" (SOLDEVE). The concept "bloomy" fits sentence 6 which reads: BECAUSE THE WINDSHIELD WAS FROZEN THINGS LOOKED "bloomy" (SOLDEVE). Sentences 5 and 6 are fused: "The car" (sent. 6) "was downstairs and the purple cloth was on the lawn" (sent. 5) "shining in, so it made the windshield of the car look 'bloomy'." It can be seen that a contextual meaning such as "bloomy" that is adequate in one sentence becomes applicable to a new sentence only when this sentence is fused with the first.

A few more illustrations that show similar processes of sentence contamination may be added:

D.W. (8-9) demonstrates the contamination of sentences 1 and 2 of series X. Sentence 2: POLICE DID NOT ALLOW THE PEOPLE TO "cross" THE STREET. Sentence 1: "All the children will have to 'cross' the street" (sent. 2) "before they come to Mary's party" (sent. 1). "So—'cross' fits this sentence."

S.G. (10-6) contaminates sentences 1 and 4 of series II (HUDRAY = "healthy"): "If you eat well and sleep well you will get 'healthy'" (sent. 1) "and not lazy and you will know to read and study" (sent. 4).

P.P. (9-4) fuses sentences 1 and 5 in series X (BORDICK = "children"). Sentence 1: PEOPLE WITH MANY "children" ARE OFTEN UNHAPPY (" 'children' fight too much"). Sentence 5: "A person has many 'children' and so they are often unhappy" (sent. 1) "because he does not listen to wise men" (sent. 5).

A.C. (9-0) contaminates sentences 1 and 3 of series IX (BORDICK = "too much money" = "too expensive"). Sentence 3: THE PLAN TO BUILD THE HOUSE WAS "too much money" BECAUSE IT COST TOO MUCH—"it must have cost thousands of dollars so they just couldn't build it." Sentence 1: "People with a plan to build a house that was too much money" (sent. 3) "were unhappy" (sent. 1).

C. Concrete, Egocentric and Imaginative Interpretation of Sentence Meaning

The child instead of altering the sentence structure may interpret its content in a rather arbitrary way. He reaches a solu-

tion by interpreting the sentence concretely, egocentrically (that is, in accord with his own private experience), by adding fanciful elements, or by selecting only a few elements instead of taking account of all the cues presented in the sentence.

Following are a number of answers illuminating such interpretations:

B.P. (8-6); "A shoe" MAY BE USED FOR SUPPORT. ("The 'shoe' gives you support in walking.") This solution was given by a young girl who had been a polio victim and wore orthopedic shoes.

A.E. (9-9): "People with marks on their face like 'pimples'," (BORDICKS) "are often unhappy." This response was given by a child who apparently was quite sensitive about his own acne condition.

L.B. (10-1): MRS. SMITH WANTED TO " 'reduce' " (HUDRAY) "the whole family. Maybe they were overweight and the doctor said they should 'reduce'." This response is from a rather obese child.

A.R. (8-11), a child of Italian origin, responds to PEOPLE TALK ABOUT THE BORDICKS OF OTHERS AND DON'T LIKE TO TALK ABOUT THEIR OWN: BORDICK is "language —say there are Italian people and the Irish make fun of their 'language' and don't even talk about their own."

C.L. (8-11): WE ALL ADMIRE PEOPLE WHO HAVE MUCH "linen" (SACKOY) "'cause it's hard to get." This girl is of low economic background.

A.B. (11-8): WE ALL ADMIRE PEOPLE THAT "hire help." This child also is of a low economic level.

P.P. (9-4) responds to PEOPLE WITH MANY BORDICKS ARE NOT WELL LIKED: "I don't like to say it—it's not nice to say it—but is it 'colored people'? Around my block boys don't like them."

P.F. (8-11): THE MORE YOU TAKE OUT OF "bubble gum" (CONTAVISH) THE LARGER IT GETS. "Because the more you take the 'bubble gum' out of your mouth the larger it gets, you know when you pull on it."

J.B. (10-0): PEOPLE WITH "a lot of money" ARE OFTEN UNHAPPY—"The children can't play 'cause they might dirty their pretty clothes, they gotta be dressed up nice all the time so they can't do nuthin."

H.R. (9-3): IF YOU HAVE DONE SOMETHING WRONG AND YOU ARE NOT AFRAID TO TELL THE TRUTH YOU HAVE "money" (SACKOY). "If I do something wrong I tell" (mother) "the truth I get a penny." This child also gives

this response: SOLDIERS NEED TO HAVE "money" (SACKOY) WHEN THEY ARE ON THE BATTLEFIELD—"if they are on the battlefield and they run out of bullets they could crawl over and buy some more if there is a store nearby."

D. Statistical Analysis of Sentence Interpretation

Sentence meanings during the process of signification are modified by the child in essentially three ways: (a) assimilation of sentence meanings, (b) contamination of sentence meanings, and (c) concrete, egocentric and imaginative interpretation of the sentence. Both assimilation and sentence contamination occur with approximately the same frequency on the first two age levels and decline significantly between the second and third age groups with little occurrence thereafter.

The developmental curve for egocentric and imaginative interpretation differs from these two forms of sentence manipulation by its more gradual decrease. There is a significant drop not only between the first and second levels but also between the later age groups (third and fourth, and fourth and fifth; Table VII).

It will be noted that practically all our subjects display egocentric and imaginative interpretation of sentences (Table VIII). One would of course predict that assimilation of sentence meanings and contamination of the sentence content of two or more different sentences are more immature, i.e., more characteristic of the younger age groups, then modification of sentence content in an imaginative and egocentric way. Our statistical results are in agreement with this expectation: at the last two levels, assimilation and sentence contamination have practically disappeared, whereas egocentric and imaginative interpretations are still very much in evidence (nine and one-half, and five occurrences per child respectively). Even educated adults who were given this test, were found not infrequently to color their interpretations of sentences by private and highly individual experience.

In concluding the two preceding sections on the semantic aspect of the test-solving activity in terms of word meanings and sentence meanings one should emphasize the similarity in the developmental curves of the processes showing a gross lack in stability and closure. Core conceptualization, assimilation, gradients, concept aggregation and sentence contamination all demonstrate that both word and sentence are not conceived as stable closed entities. The developmental curves of these processes show a close correspondence; their immaturity is reflect-

TABLE VII

IMMATURE PROCESSES INVOLVED IN SENTENCE MANIPULATION: MEAN FREQUENCY

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Assimilation	3.48	3.28	0.44	0.04	0.00	II/III
2. Sentence-Contamination	3.64	3.40	0.88	0.44	0.12	*II/III*
Sum 1+2	7.12	6.68	1.32	0.48	0.12	II/III
3. Egocentric and Imaginative Interpretation	15.28	13.16	12.68	9.60	4.96	I/II, II/IV, III/IV, IV/V

* Italics indicate differences between the means significant at the .01 level of confidence; all other differences noted are significant at the .05 level.

TABLE VIII

IMMATURE PROCESSES INVOLVED IN SENTENCE MANIPULATION: PER CENT OF SUBJECTS SHOWING PROCESSES

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Assimilation	64	28	16	4	0	I/II
2. Sentence-Contamination	80	76	36	28	12	II/III
Sum 1+2	84	76	64	20	12	*III/IV*
3. Egocentric and Imaginative Interpretation	96	100	100	100	100	

* Italics indicate differences between the per cents significant at the .01 level of confidence; all other differences noted are significant the .05 level.

ed in a significant early decrease with almost no occurrence on the last two levels.

IV. GRAMMATIZATION: LEXICALIZATION AND SYNTACTIC STRUCTURIZATION

We previously emphasized the interdependence of the semantic and linguistic—structural aspects of signification. Semantic as well as grammatical lack of differentiation of word and sentence are but two aspects of immature language comprehension. A subject is able to give adequate signification to the unknown word only if he grasps the nature of the sentence as a stable and articulate structure, and the word as a relatively self-contained unit within it.

The analysis has brought out two principal forms of an immature grasp of linguistic structure demonstrating this lack in articulation: Immaturity of *Lexicalization,* i.e., a lack in distinguishing word form from sentence form; and Immaturity of *Structurization of Sentence,* i.e., a lack in recognition of the sentence as a definite, stable grammatical construction.

A. Immaturity in Lexicalization

In the task of finding the meaning of a word the child has to cope with its twofold nature; he must comprehend that the word is an articulate part of a sentence, and yet recognize that it is also a self-contained lexical unit. Inability to comprehend the word as an articulate part of a sentence necessarily precludes its comprehension as a lexical unit. But the child might be quite able to use as a solution an articulate word in a sentence and still not be able to treat it as a separate lexical unit. This is reflected by the discrepancy, exhibited by the young child, between his capability in fitting an adequate word into the various test sentences, and his difficulty in isolating it from the sentence in order to explicitly state an over-all solution.

One of our children, for instance, correctly translated PROTEMA as "finish" within individual sentences of series IV, but when asked finally to state the over-all meaning of PROTEMA independent of the individual sentences, he replied: " 'job' all the sentences have to do with 'job'." The fact that the child regressed to core conceptualization when asked for an over-all meaning is indicative of his difficulty in differentiating between word and sentence, semantically as well as linguistically.

Probably the most impressive demonstration of this feature of immature language structurization are those cases, previously

mentioned, where the child, being asked for the definition of a word, employs a definition couched in what seems to be a restatement of the sentence.

L.P. (9-5) defines BORDICK (in series IX) by restating sentence 4 almost completely: "People talk about other people and don't talk about themselves."

C.L. (8-11) similarly defines SACKOY (series VII) in terms of sentence 4: "Saving people from drowning."

L.P. (9-5) again, reports that ONTRAVE means that "children don't think their mother will get well."

Often, as in the last illustration, a smaller portion, rather than all of the sentence, is fused with the word. When these portions become restricted to neighboring parts of the word it assumes the characteristics of a *gradient.*

In certain instances, where the child may seemingly have grasped the relation between the word and sentence in one situation, it may later become clear that this has not been the case; for the child, moving on to the next situation, appears incapable of extracting his solution for the purpose of fitting it into a new sentence.

Clearly demonstrating this are cases where the child cannot identify the word which in two different contexts, is lexically the same.

A.C. (9-0), starting with sentence 6 of series IV, appeared to apply correctly the solution "finish": THE PAINTER COULD NOT "finish" THE ROOM BECAUSE HIS BRUSH BROKE. Attempting to fit "finish" into sentence 5 the child says: "A child should try to 'finish' his homework when it is only half done," but surprisingly enough rejects "finish" as a solution for this sentence by stating: " 'finish' does not fit—the child is not a painter."

Inarticulateness of word-sentence relationship is possibly the underlying factor in a number of cases where the child is at a loss to state a reason for his solution. For example:

A. S. (8-9) in fitting "water" in sentence 1 of series III remarks: "But I don't know how it fits — but it does!"

M. B. (9-8) offers "gaiety" for sentence 2 of series XI: IF YOU BELIEVE IN "gaiety" YOU ARE A GOOD PERSON — "yeh, I can't exactly explain it — in a lot of these sentences it's yes but when it comes down to explaining them it's no!"

Though the evidence is not entirely conclusive, the underlying difficulty seems to be that of lifting a concept out of its context necessary for the formulation of an explanation.

B. Immaturity in Syntactic Structurization

For adequate solution, the test requires not only the comprehension of words as lexical units but also of sentences as stable

and closed structures. The young child quite frequently views the sentence as a more or less fluid composition of cues with shifting dominance; the sentence lacks closure thus permitting the intrusion of elements that are not objectively given.

That structure cannot be considered without meaning becomes evident from the examination of instances of assimilation.

In one of the previously mentioned examples, a child, achieving integration by identification of the various sentences, arrives at an over-all core-concept "leave enough space." Sentence 2 of series II which reads, MRS. SMITH WANTED TO HUDRAY HER FAMILY, is reformulated by the child as follows: MRS. SMITH "wanted her family to 'leave enough space-like' in her house (she wanted them to leave room for some new furniture)." Then coming to sentence 5 which reads: TO HUDRAY THE NUMBER OF CHILDREN IN THE CLASS THERE MUST BE ENOUGH CHAIRS, the child states: "You have to 'leave enough space' for the rest of the children so the rest will have chairs, you make space by two children sitting in the same seat." As one can see from these examples the child, unconcerned about the stability of sentence structure, reshapes the given sentence in such a manner that the core-concept appears to fit.

Again, the contamination of two or more contextual meanings which we have observed as a characteristic of immature signification, would not be possible if the child would heed the closed nature of a sentence. As one will recall, the fusion of contextual meanings involves the selection of elements from one sentence and their insertion into another sentence (see p. 51). In the main, the observed grammatical alterations are here a consequence of the attempt to maintain the identity of a word meaning in the various sentences. The following illustrations serve to demonstrate the manner and extent of such sentence alteration.

B.P. (8-6) fits a previously obtained concept, "help," into sentence 6 of series X—JIMMY LIDBERED STAMPS FROM ALL COUNTRIES: "Jimmy 'helped' the people by giving his stamps to the bank and sending the money to all the countries." She further fits "help" into sentence 3 — THE PEOPLE LIDBERED ABOUT THE SPEAKER WHEN HE FINISHED HIS TALK: "The people tried to 'help' the speaker to finish his talk because he was all mixed up."

P.P. (9-4) fits his solution "family" into sentence 3 of series IX—THE PLAN TO BUILD A HOUSE WAS A BORDICK BECAUSE IT COST TOO MUCH: "The 'family' likes to build a nice house—so it costs a lot of money."

Less severe grammatical changes pertain mostly to sentence construction dealing with small abstract words such as auxiliary verbs, conjunctions, etc.:

P.M. (9-1) applies "nice" in sentence 1 of series VII—WE ALL ADMIRE PEOPLE WHO HAVE MUCH SACKOY as follows: WE ALL ADMIRE PEOPLE "because they're 'nice'."

M.G. (8-8) offers "smart" for sentence 4 of series VII—A PERSON WHO SAVES A BABY FROM DROWNING HAS MUCH SACKOY: A PERSON WHO SAVES A BABY FROM DROWNING "is 'smart'."

C.L. (8-11) fits "very good" in sentence 5 of series XII—JOHNNY ONTRAVED THAT MARY WOULD LIKE HIM: JOHNNY "was 'very good' so" MARY WOULD LIKE HIM.

C. Statistical Analysis: Lexicalization and Syntactic Structurization

1. *Lexicalization*

We have used several indicators of the child's inability to comprehend the word as a lexical unit, i.e., to conceive of the word as an articulate entity relatively independent of the sentence context in which it appears. These indicators are: core conceptualization, contamination of core solutions and gradients.

Tables IX and X summarize the trends of lexicalization.

One fact stands out clearly: the lack of lexicalization appears to be most prominent with the first two age groups. We observe a sharp drop in mean frequency to the third group for all indicators, with very slight incidence thereafter. This trend is also apparent with respect to the percentage of children involved. Practically all children of the first age group give some evidence of a lack of lexicalization, whereas less than a third in the last age group occasionally show a response of this sort.

2. *Syntactic Structurization*

We distinguished two forms of alterations of the sentence made by the child: (a) a more or less radical change of the grammatical structure of the test sentence, and (b) slight changes which leave the grammatical structure basically intact. From Tables XI and XII it is apparent that changes of the grammatical structure decrease considerably with increasing age. There is this difference between the more severe and the slighter grammatical changes; though they occur with practically the same frequency on the first two levels, radical alterations *(molding)* in contradistinction to slight grammatical changes completely disappear after the third level. On the fifth age level we find

TABLE IX

PROCESSES INDICATING IMMATURE LEXICALIZATION: MEAN FREQUENCY

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Sent.-Core and Assimil.	6.24	4.28	0.68	0.04	0.08	II/III
2. Gradients	4.52	3.12	0.60	0.04	0.24	*II/III*
Sum 1+2	10.76	7.40	1.28	0.08	0.32	*II/III*

* Italics indicate differences between the means significant at the .01 level of confidence; all other differences are significant at the .05 level.

TABLE X

PROCESSES INDICATED IMMATURE LEXICALIZATION: PER CENT OF SUBJECTS SHOWING PROCESSES

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Sent.-Core and Assimil.	76	48	20	4	8	I/II, II/III
2. Gradients	84	80	40	4	24	II/III, *III/IV*
Sum 1+2	96	80	52	8	32	II/III, *III/IV*

* Italics indicate differences between the per cents significant at the .01 level of confidence; all other differences are significant at the .05 level

TABLE XI

PROCESSES INDICATING IMMATURE SYNTACTIC STRUCTURIZATION: MEAN FREQUENCY

PROCESS	I	II	III	IV	V	MAIN SIGNIF. DIFF*
1. Sentence-Contamination	3.64	3.40	0.88	0.44	0.12	*II/III*
2. Molding	4.40	3.00	0.68	0.00	0.00	*II/III*
3. Mild Gramm. Change	4.60	3.36	1.44	0.92	0.16	*II/III*
Sum 2+3	9.00	6.36	2.12	0.92	0.16	*I/II, II/III*
Sum 1+2+3	12.64	9.76	3.00	1.36	0.28	*I/II, II/III*

*Italics indicate differences between the means significant at the .01 level of confidence.

TABLE XII

PROCESSES INDICATING IMMATURE SYNTACTIC STRUCTURIZATION: PER CENT OF SUBJECTS SHOWING PROCESSES

PROCESS	I	II	III	IV	V	MAIN SIGNIF. DIFF*
1. Sentence-Contamination	80	76	36	28	12	*II/III*
2, Molding	68	60	36	0	0	*III/IV*
3. Mild Gramm. Change	92	72	56	36	16	I/II
Sum 2+3	100	76	64	36	16	*I/II*
Sum 1+2+3	100	88	64	44	24	I/II, III/V

*Italics indicate differences between the per cents significant at the .01 level of confidence; all other differencs noted are significant at the .05 level.

the great majority of children respecting the grammatical structure.

The developmental curves for syntactical structurization and lexicalization are quite similar. This gives some support to the view expressed by developmental psychologists that there is a genetic interdependence or correlative development of the word as a lexical unit and the sentence as an articulate structure.

V. CONCRETE SYMBOLISM

A. Homophonic Word Symbolism

The relation between a symbol and the object for which it stands ("referent") is, in our adult culture, mainly an *indirect* one: the word is a sign that is conventionally used to represent a referent. "Anthropos," "homme," "man" are applied, in the various languages, whenever reference to a member of the human race is made. In concrete symbolic behavior the relationship between sign and referent is perceived as a *direct* one, i.e., the sound patterns are comprehended as directly conveying the meaning: *Homophonic Word Symbolism.*

Homophonic word symbolism involves a lack of differentiation between meaning and sound pattern. Rather than apprehending the sound pattern as an artificial or conventional symbol for an object the child identifies sound and meaning. In our test homophonic symbolism expresses itself in the tendency of the child to attribute the meaning of a known word to the test word because the two sound similar. For instance:

J.Z. (9-6) conceives of ONTRAVE as "food" because of the similarity ONTRAVE bears to "entree."

P.M. (9-1) supplies "ashes" for ASHDER in sentence 3 of series V: "but I don't know how it fits."

J.S. (8-8) replies, when asked for the over-all meaning of LIDBER: "I think lidber is 'leave' but it doesn't fit any sentence—lidber sounds like 'leave' so it must be it."

G.D. (9-3) offers "hurry" for HUDRAY in sentence 1 of series II: "When you eat, some people eat fast and when you sleep some people sleep fast."

In some instances homophonic symbolism occurs in the form of sound pattern contamination; for example:

L.B. (10-1) employs "betrave" for ONTRAVE (in the sense of betray) in sentence 6 of series XII and reports: "The doctor asked for money and he gave her poison pills to drink with water and then she died and the doctor kept all the money for himself. He shouldn't have spent it for himself he should have spent it for new equipment; and that's betrave."

Neologic Symbolism: In some instances an artificial word is used without "translating" it into a conventional English word. Such usage seems closely related to the neologisms that one finds in early childhood speech. It is plausible to subsume neologic symbolism under homophonic realism since the child perceives the sound pattern in itself to be meaningful enough to be used in a sentence. For example:

F.V. (9-11) responds to sentence 3 of series III—BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE CONTAVISHES: " 'Plaster' goes on the walls not 'contavishes'." In regard to sentence 4—YOU CANNOT FEEL OR TOUCH A CONTAVISH he states: "But you could feel and touch a 'contavish' because I said you could hold it."

P.M. (9-1) responds to sentence 6 of series I: "No it doesn't fit—he doesn't mix it with a 'corplum'." To the experimenter's question—What is a CORPLUM?—the child answers: "I don't know."

A.S. (8-9) remarks: "I don't know what a 'contavish' is but it fits these three sentences" (series III, sentences 1—3).

P.M. (9-1) responds to sentence 6 of series VIII — IF BOB PRIGNATUS SOMEBODY HE MAKES SURE THEY DON'T FIND OUT: "He'll make sure that nobody knows what he did if he 'prignatus' somebody." What does PRIGNATUS mean? "I don't know."

F.V. (9-11) after having successfully used the solution "nerve" for ASHDER, in the various sentences, states at the last sentence: "Before finishing the task he had the nerve to throw away" (get rid of) "a few 'ashders.' "

A.C. (8-9) responds to sentence 4 of series III: "You can't feel or touch a 'contavish' because that is what it says here."

B. Sentence Realism

Another principal form of concrete symbolization as it appears in our test situation, refers to the sentence. In everyday life situations, language is used to a great extent to impart concrete actual information. This fact distinguishes sentences of the kind used in this study from those involved in concrete social intercourse. In adequate test behavior the content of the test sentence is conceived as lifted out of the sphere of actuality and placed into the sphere of possibility. The verbal symbols refer to possible or hypothetical statements rather than to actual events. For instance, the first sentence of series I is to be understood as a hypothetical (possible) proposition implying, "If (as is stated here) a CORPLUM is used for support, a CORPLUM may

be . . . ." In contradistinction to verbal behavior within everyday concrete situations, the attitude required in our test may be termed "abstract-symbolic attitude."

For the person taking a concrete symbolic attitude in this test, the sentence conveys information about an actual event; for him the first statement becomes: "There is an object, namely a CORPLUM, which is used actually for support." A subject behaving on an abstract-symbolic plane views the sentence content as an ideal, timeless event; a child, concretely symbolizing, deals with it as a realistic happening within his own life-space. In the latter case, the actual event conveyed by the sentence can, therefore, be treated "normatively," i.e., evaluated in terms of morality, of truth, of agreement with personal experience, etc. There are degrees and qualitative variations in the concreteness of symbolic behavior as demonstrated by our examples.

The lack in the grasp of the hypothetical nature of the test sentences is well illustrated by the manner many of the younger children view sentence 3 of series I: A CORPLUM MAY BE LONG OR SHORT, THICK OR THIN, STRONG OR WEAK. This sentence elicits the following typical responses:

One child of nine years, after having supplied "door" as the solution for sentences 1 and 2 in series I, responds to sentence 3 in this manner: "It is thick and long."

Another nine-year-old child, after having supplied "water" as the solution, in thinking of Niagara Falls responds, "It is strong."

These children conceive of CORPLUM as an object having specific and definite properties. They do not apprehend it as signifying a concept that possesses a range of potential properties. To a child that conceives of the word as indicating a concrete object, being long *or* short, would be a contradiction. As one nine-year-old child expressed it: "You are going to put all of them in one sentence, long, short, thick, thin, strong, weak? —so it doesn't make sense—so it's wrong."

Other responses clearly show the child's attitude toward the content of the sentence as being an actual event. The content is evaluated in terms of its compatibility with concrete reality; he agrees with it, he denies it, he comments on it.

D.W. (8-7) objects to sentence 2 of series III—THE MORE YOU TAKE OUT OF A CONTAVISH THE LARGER IT GETS: "The more you take out the less you get (instead of more). That's wrong in the sentence—it gets less."

The same child, similarly, remarks to sentence 1 of series III—YOU CAN'T FILL ANYTHING WITH A CONTAVISH: "But you could so—you could fill lots of things with it."

N.F. (9-0), after having presented "stick" as solution for sentence 6 in series I—THE PAINTER USED A "stick" TO MIX HIS PAINTS, fits "stick" into sentence 5—YOU CAN MAKE A CORPLUM SMOOTH WITH SANDPAPER—with this reservation: "some painters maybe don't like smooth sticks."

Other comments of some of the children indicate that the sentence content is viewed as referring to his private experience rather than as being in the range of realistic possibility. These are illustrations:

B.B. (9-3) responds to sentence 1 of series X—ALL THE CHILDREN WILL LIDBER AT MARY'S PARTY: "lidber means friends. If I give a party I invite only my friends and my cousins and my aunts and my uncles."

S.L. (9-1) replies to sentence 4 of series IX—PEOPLE TALK ABOUT THE BORDICKS OF OTHERS AND DON'T LIKE TO TALK ABOUT THEIR OWN: "bordick means 'children'—it's the other way around with my mother. I'm a bad kid, she tells about me but not too much."

E.A. (11-3) forms the solution "take the family out" for sentence 2 of series II — MRS. SMITH WANTED TO HUDRAY HER FAMILY. In fitting it into the first sentence—IF YOU EAT WELL AND SLEEP WELL YOU WILL HUDRAY—the child says: "Sometimes my mother says if you eat well and sleep well you will go out on my bicycle or something."

The apprehension of sentences in terms of concrete happenings rather than of hypothetical, timeless propositions makes it possible for the child to conceive of a series of sentences as a storylike sequence taking place at a given time.

L.W. (9-11) offers successively two solutions for sentences 2 and 6 of series II, viz., "feed" and "fix": MRS. SMITH WANTED TO "feed" HER FAMILY; YOU MUST HAVE ENOUGH SPACE IN THE BOOKCASE TO "fix" YOUR LIBRARY. Going back to sentence 2, the child, on questioning, denies that "fix" could fit sentence 2: "No, if Mrs. Smith wanted to 'feed' her family she could not 'fix' her library or bookcase while she is feeding her family."

Sometimes the language behavior may become so extremely concrete that in the story created, the characters themselves actually appear to deal with the test sentences, e.g., they read the sentences, etc.

A.C. (9-0)—sentence 5, series VIII: A GOOD MAN WHO TELLS THE TRUTH WILL NEVER "disobey" (PRIGNATUS) YOU. The child continues: "This man told the truth, he must have read the fourth sentence, I think, and that taught him a

lesson that he shouldn't tell a lie—if you tell a lie you don't get away with it, they always could find out."

The same child states for sentence 4, series IV—JOHN CAN'T PROTEMA THE PROBLEM BECAUSE HE DOESN'T UNDERSTAND IT: "John did not have patience to do his homework because he doesn't understand it—John must have read the sentence 2 and didn't understand it and must have called somebody to help him."

Further evidence of this extreme concrete attitude toward the test sentences is conveyed by instances where the child fuses his own test-solving activity with the story characters about which he thinks the sentence deals.

A.S. (8-9) shows such fusion between test activity and story events. To sentence 4 of series IV—JOHN CANNOT PROTEMA THE PROBLEM BECAUSE HE DOES NOT UNDERSTAND IT —he remarks: "It's hard for John—he can't figure them out like I can't figure them out" (i.e., these sentences).

Other types of responses reflect the concrete symbolic attitude through normative evaluations of the sentence content. These evaluations are in terms of morality, desirability, utility, etc.

E.C. (10-5) responds to sentence 3 of series IV — PHILIP ASKED JOHN TO HELP HIM PROTEMA HIS HOMEWORK: "Protema means 'continue.' He shouldn't ask anybody to 'continue' his homework, he should do it himself."

The same child states for sentence 2—IF A JOB IS HARD HARRY DOES NOT PROTEMA IT: "He should take the job and do the hard work, Harry does not do it. He should do it and take it."

B.B. (9-3) does not attempt to find a meaning for BORDICK in sentence 3 of series IX—THE PLAN TO BUILD A HOUSE WAS A BORDICK BECAUSE IT COST TOO MUCH. Instead she declares: "The plan to build the house cost too much. If you just stuck up plain boards it would cost you less."

C.E. (10-0) reacts to sentence 3 of series IV—PHILIP ASKED JOHN TO HELP HIM PROTEMA HIS HOMEWORK by saying: "If the boy can't 'do' his homework at home he should do it some other place."

H.R. (9-3) offers a solution for sentence 3 of series III—BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE "holes" (CONTAVISHES), but continues: "If there are 'holes' they should plug them up."

E.L. (9-6) protests to sentence 2 of series IV—IF A JOB IS HARD HARRY DOES NOT PROTEMA IT: IF A JOB IS HARD HARRY DOES NOT "do" IT. "But he had to 'do' it because he gets paid for it."

M.G. (8-8) responds to sentence 4 of series X—PEOPLE "collect" QUICKLY WHEN THERE IS AN ACCIDENT: "They should get together and 'collect' money so he has the proper treatment he deserves."

L.B. (10-1) makes this statement in response to sentence 6 of series XII—ACCORDING TO WHAT THE DOCTOR SAID, THE CHILDREN COULD NOT ONTRAVE THAT THEIR MOTHER WOULD GET WELL: "She died and the doctor kept all the money for himself—he shouldn't have spent it for himself; he should have spent it for new equipment."

C. Statistical Analysis of Concrete Symbolism

Both indicators of concrete symbolization—homophonic word symbolism and sentence realism—decline with age (Tables XIII and XIV).

Homophonic word symbolism occurs only at the first two age groups. Sentence realism is still noticeable on the third level but there is little sign of it on the fourth and fifth levels. The indicators of concrete symbolism combined show a significant drop in mean frequency from the first to the second, and second to the third age groups. The general developmental decline demonstrates itself also with respect to the percentage of children: about 75 per cent of the children in the first two age groups evidence a concrete symbolic attitude as contrasted with 15 per cent of the older subjects showing any signs of concrete symbolization. Generally then, the results indicate (1) that concrete symbolism as a sign of immature language behavior is characteristically present with children up to about 11 years of age, and (2) that homophonic word symbolism appears to be a sign of greater immaturity of verbal behavior than sentence realism.

The maturational stage of speech is probably most basically determined by the level of symbolic behavior; the degree of concreteness or abstractness of the symbolic attitude profoundly influences the manner of signification.

There are other, very general, factors which decidedly affect verbal behavior. Some of these factors are discussed below viz., flexibility and rigidity in verbal test performance, and autocritical evaluation of one's own solutions.

TABLE XIII

CONCRETE SYMBOLISM: MEAN FREQUENCY

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Homophonic Symbolism	1.32	0.96	0.00	0.00	0.00	II/III
2. Neologic Symbolism	0.44	0.32	0.12	0.00	0.00	—
Sum 1+2	1.76	1.28	0.12	0.00	0.00	*II/III*
3. Sentence Realism	1.76	0.96	0.84	0.24	0.12	*I/II*, III/IV
Sum 1+2+3	3.52	2.24	0.96	0.24	0.12	I/II, *II/III*

* Italics indicate differences between the means significant at the .01 level of confidence; all other differences noted are significant at the .05 level.

TABLE XIV

CONCRETE SYMBOLISM: PERCENTAGE OF SUBJECTS SHOWING PROCESSES

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. Homophonic Symbolism	32	32	0	0	0	*II/III*
2. Neologic Symbolism	12	12	12	0	0	—
Sum 1+2	40	36	12	0	0	—
3. Sentence Realism	76	60	52	20	12	III/IV
Sum 1+2+3	80	68	56	20	12	III/IV

* Italics indicate differences between the per cents significant at the .01 level of confidence; all other differences noted are significant at the .05 level.

VI. RIGIDITY AND FLEXIBILITY; AUTOCRITICAL ATTITUDES

A. Rigidity

Rigidity can generally be best defined as a lack of variability of response in regard to the demands of a task. Autocriticism refers to a subjective attitude toward one's own achievement. Though flexibility does not necessarily involve autocriticism, the autocritical attitude plays an important role in the development of flexible behavior in higher order problem-solving activity such as required by our test.

In the light of previous work in the field of comparative and genetic psychology one can be sure that a high degree of rigidity characterizes activity at a lower stage of development. This observation is in accordance with the results of our quantitative analysis, which shows a decrease in the frequency of signs of rigidity with increase of age. We selected a number of overt signs as indicators of rigidity. These signs are the following: One-solution rigidity, two-solution rigidity, no-solution rigidity, perseveration, and forcing a solution.

One-solution Rigidity: The child, though recognizing that a particular solution fits only one sentence, retains it as the solution for that sentence. The adherence to one solution obstructs attempts to modify or shift to another solution for that specific sentence.

Two-solution Rigidity: This involves the retention of two distinct solutions each fitting into one of the sentences; for example:

N.F. (9-0), in series VI, offers "bumpy" as solution for sentence 2 and "different color" for sentence 5. The child declares: "'different color' doesn't fit 2 because that's about 'bumpy' and this is about 'different color'—so soldeve means 'bumpy' in sentence 2 and 'different color' in sentence 5."

No-solution Rigidity: The child, after having developed a concept which he has applied to a number of sentences, is confronted with a new sentence to which the concept cannot be applied. In spite of this inadequacy the concept is retained for the previous sentences and no solution is offered for the new sentence. One of many examples is the following:

D.W. (8-7) arrives at concept, "sand in your eyes," for HUDRAY (series II) in sentence 1: IF YOU EAT WELL AND SLEEP WELL YOU WILL "get 'sand in your eyes'." She uses this concept in sentence 2—MRS. SMITH WANTED TO HUDRAY

HER FAMILY: "She wants to put 'sand in their eyes' maybe 'cause she wanted them to go to sleep." Confronted with sentence 3 she states: "That doesn't make sense—she can't put 'sand in the dresses eyes'—I don't know, it doesn't fit." No alternate solution can be offered. Proceeding to sentence 4 she says: "No it doesn't fit—hudray means only one thing and it only means 'sand in your eyes'—no it doesn't fit in this sentence either—I don't know what could, except 'sand in your eyes' and that doesn't fit here."

Perseveration: Rigidity has often been viewed as being synonymous with perseverative behavior; here, the term "perseveration" is limited to the retention of a concept that has been attained in a previous series.[1] To illustrate:

B.B. (9-3) carries the final solution for series VII, "insult," the concept "don't mind." Coming to the first sentence of series IX the child reports: " 'hard heads'—when people tell them something and they 'do not mind' that's why people don't talk to them and that's why he's unhappy because he is 'hard-headed' he 'doesn't mind' other people."

B.B. (9-3) carries the final solution for series VII, "insult," over to series IX. To sentence 2 he responds: "A person who is 'insulted' doesn't like to work in that place."

Forcing a solution: In many instances the child may rigidly adhere to one solution and by *forcing* the issue may place it, in spite of ill fit, into other sentences.

The child will the more succeed in the attempt to force a concept into a sentence the more labile the sentence and word structure is perceived by him. To illustrate:

G.H. (9-10) offers "car" as the solution for series V. The solution is obtained in sentence 4 and forced to fit the preceding and following sentences; e.g., in sentence 5—BEFORE FINISHING THE TASK HE HAD TO GET RID OF A FEW ASHDERS: "You should go and tell the 'cars' not to make too much noise because say the task is to multiply 50 x 5, you can't think if there is a lot of noise around." In sentence 6—JANE HAD TO TURN BACK BECAUSE THERE WAS AN ASHDER IN THE PATH: "Maybe Jane forgot her 'car' and it was there in the path and she had to turn back to get it."

Statistical Analysis of Rigidity and Flexibility: According to Table XV, the combined responses indicating rigidity decline

[1]Some clinicians have called this type of perseveration *iteration.*

in frequency of occurrence noticeably as age increases (significant drops between the first two and between the last two groups).

However, the developmental trends of the various forms of rigidity which we distinguished show individual deviations from this accumulative curve. We gain some insight into these deviations from a brief consideration of the qualitative differences between various forms of rigid responses and their underlying causes.

First of all, there is a primary inability to shift from an obtained solution; probably a principal underlying factor is the strong embeddedness of a particular solution in a sentence context. Such a primary cause of verbal rigidity seems to be the predominant factor underlying two-solution rigidity, no-solution rigidity and perseveration. There are additional factors, causing rigid performance, which are of a more general nature. The forcing of a solution, for instance, may have a number of causes of which only one may be primary rigidity. The protocols of older children as well as adults indicate that such general factors as desire to test out a solution as far as possible, maintenance of personal prestige, etc., are operative in forcing a solution. In cases of one-solution rigidity it also seems impossible to separate psychologically the factor of primary verbal rigidity from the secondary factors. That a distinction between responses based on primary rigidity alone, and responses where additional secondary factors are involved, is psychologically sound, has been borne out by the statistical analysis.

Responses defined by us as mainly due to primary verbal rigidity (two-solution rigidity, no-solution rigidity and perseveration) show a significant drop between the first and second age groups, with little occurrence thereafter (Table XV). The other two forms of rigid responses (one-solution rigidity and forcing a solution) differ from the primary rigidity responses in their developmental trends. One-solution rigidity generally decreases throughout the ages; it drops significantly from the first to the second age group but, in contradistinction to the forms of primary rigidity, occurs still at relatively high frequency (6.68 occurrences per child) with the older children. Forcing remains fairly constant as to frequency with the first four age groups, decreasing considerably only between the last two age groups.

B. Autocriticism

1. *Awareness of Inadequacy and its Effect upon Performance*

It is in the nature of the proper test-solving attitude that the subject, moving from sentence to sentence, modifies or

TABLE XV

RIGIDITY AND FLEXIBILITY: MEAN FREQUENCY

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. One-solution Rigidity	17.08	11.24	11.40	9.88	6.68	I/II
2. Two-solution Rigidity	2.12	0.40	0.32	0.04	0.04	—
3. No-solution Rigidity	0.76	0.40	0.24	0.24	0.60	—
4. Perseveration	0.44	0.20	0.08	0.16	0.08	—
5. Forcing a Solution	6.68	6.20	6.60	5.24	2.84	III/V
Sum 2+3+4	3.32	1.00	0.64	0.44	0.72	I/II
Sum 1+2+3+4+5	27.08	18.04	18.64	15.56	10.24	I/II, IV/V
6. Autocriticism	0.44	0.36	1.60	1.60	1.72	II/III

*Significant at .05 level.

TABLE XVI

RIGIDITY AND FLEXIBILITY: PERCENTAGE OF SUBJECTS SHOWING PROCESSES

PROCESS	AGE GROUP I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)	MAIN SIGNIF. DIFF.*
1. One-solution Rigidity	100	96	100	100	96	—
2. Two-solution Rigidity	28	16	12	4	4	—
3. No-solution Rigidity	44	24	16	20	28	—
4. Perseveration	16	16	8	16	8	—
5. Forcing a solution	96	96	92	88	96	—
Sum 2+3+4	56	44	32	40	36	—
Sum 1+2+3+4+5	100	100	100	100	100	—
6. Autocriticism	28	28	60	52	64	II/III

*Significant at .05 level.

replaces a preliminary solution, until he arrives at the final concept. The modification or elimination of already formed concepts presupposes an evaluation—implicit or explicit—of one's own solutions.

Our analysis can only take into account explicit indications of autocriticism as it affects the performance. These effects of autocriticism upon procedure, as illustrated below, are fourfold:

a. Retention in spite of awareness of inadequacy:

L.F. (8-10) asks at sentence 6 of series IX (YOUR WORK WILL NOT HAVE A BORDICK IF YOU ARE SMART AND WORK HARD): "Is it all right if I take a couple of words out and make the sentence shorter?" He then uses "think" for BORDICK by altering the sentence structure: "A man does not have to 'think' if he is smart (he won't have to think when he is doing an example)." Though he is aware of the inadequacy of the concept to fit the sentence as it stands, he retains it by deliberately altering the sentence structure.

Similarly H.R. (9-3) places "learn" into sentence 2 of series II—MRS. SMITH WANTED TO HUDRAY HER FAMILY: "Mrs. Smith wanted her family to learn." He remarks: "That sentence I turned around."

In the following example F.M. (12-0) appears quite aware that he is contaminating sentences 3 and 4 of series IX; he states in response to sentence 4: "They wouldn't talk about theirs because they don't want it found out about the trouble with the house. I'm combining the same people from sentence 3 with the people in this sentence" (sent. 4).

b. Retention with reservation: There are a number of instances where the child, in spite of being aware of the inadequacy of the fit, accepts the solution but expresses some doubt.

B.B. (9-3) comments on his solution for sentence 1 of series II—IF YOU EAT WELL AND SLEEP WELL YOU WILL "good" (HUDRAY): "It might fit but doesn't really make sense and it's not good English—but it fits according to your teacher and your mother."

R.D.S. (11-2) reads sentence 2 of series IX: PEOPLE WITH "problems" (BORDICKS) ARE NOT WELL LIKED. Then he makes this comment: "Maybe a person who has a hard 'problem' wants somebody else to solve it so he isn't so well liked 'cause the other person can't solve it—I don't know why he isn't well liked—it doesn't exactly fit." In spite of this remark he retains "problems" as a solution for the sentence.

C.S. (11-6) comments on his solution for sentence 2 of series II — MRS. SMITH WANTED TO "keep her family healthy" (HUDRAY HER FAMILY): "I don't think it's quite right—but I can't think of anything else."

c. *Reserved rejection of inadequate solutions:*

S.E. (11-7) reads sentence 1 of series I: A "wall" (CORPLUM) MAY BE USED FOR SUPPORT and declares: "It doesn't really fit—of course you could lean on a 'wall' — except I wouldn't say it."

P.N. (13-3) responds to sentence 2 of series XI: IF YOU BELIEVE IN "police" (POSKON) YOU ARE A GOOD PERSON. "No, 'police' doesn't fit 'cause it's silly—if you were a silly person you might say it fits." Here, a farfetched concept is rejected though the child grants the possibility of forcing such a concept into the context.

d. *Complete rejection of inadequate solutions:*

P.H. (11-6) responds to sentence 6 of series VI: BECAUSE THE WINDSHIELD WAS FROZEN THINGS LOOKED " 'hard' —hard to see through. No—it doesn't fit." The child is here rejecting a holophrastic concretization of the previous solution "hard."

M.B. (11-5) rejects his tentative solution for sentence 2 of series II—MRS. SMITH WANTED TO "make healthy" HER FAMILY: "The idea" (something about healthy) "fits but not the word." The concept "healthy" of the previous sentence is rejected because it would fit only by holophrastically modifying it.

A.R. (11-8) abandons the solution for sentence 2 of series VIII—MARY DID NOT KNOW THAT JANE USED TO "hit": " 'Jane used to hit' wouldn't be a complete sentence, it doesn't tell what she used to 'hit'." Here the solution is rejected because the child recognizes that it would only fit if it were holophrastically interpreted.

If one compares the various instances of critical evaluation one notes that, with few exceptions, the inadequacies that are recognized pertain to immature processes of signification. The critical attitude thus reflects the growing attempt of the child to overcome early forms of language behavior. Our protocols show that the children become first aware of the most immature processes involved in signification, such as core conceptualization, gross changes of sentence meaning and structure etc. Later on, less immature forms, such as holophrastic con-

cretization, forced, farfetched conceptualization, holophrastic solutions come under scrutiny. On the other hand, the younger children though recognizing an inadequacy, usually do not consider it to be severe enough to discard the solution. The less immature children, in retaining it, often express reservations; with increasing maturity the children tend to reject immature solutions with less and less reluctance.

2. *Absolute vs. Relative Adequacy*

The older children seem to be concerned not only with adequacy of a solution in absolute terms, i.e., with its fitness or nonfitness, but with degrees of suitability. They demonstrate often, by their comments, a capacity to weigh a concept in terms of greater or lesser adequacy and to proceed by steps leading to a final solution.

The use of qualifying expressions, such as "something about," "not quite but almost complete," etc., displays the child's appreciation of the relative distance from a satisfactory solution. For instance:

M.B. (11-3) remarks at sentence 2 of series II: "hudray means something somewhere around 'filling needs'."

G.C. (11-3) evaluates his tentative solution for sentences 6, 4, 5 of series II: " 'build' fits a little."

P.H. (12-4) states for sentence 5, series XI: " 'help' fits halfway." The same child, after having found "hole" as a solution for sentence 5 of series III, comments: "I am coming closer—I think I am getting it."

Thus, whereas a younger child simply states whether a concept is either correct or incorrect, the older child often shows by his remarks that he is aware of the relative distance to the goal.

3. *Statistical Analysis of Autocriticism*

Since autocriticism is a sign of flexible behavior, one should expect its developmental trend to be a reversal of that of rigidity.

The statistical results summarized in Tables XV and XVI confirm this expectation: autocriticism generally increases with age. One should note, however, that this increase is not gradual: on the first two age levels, instances of critical evaluation are few; there is a sharp and significant increase from the second to the third age group and only a slight change at the last two levels.

Section Two

SYNOPTIC REVIEW AND DISCUSSION OF THE RESULTS

The Word-Context test has been designed to determine, through an experimental analysis, the ways in which individuals arrive at the meaning of an artificial word appearing in a number of verbal contexts.

The individuals tested were children between the ages of 8½ and 13½ years, with an interquartile I.Q. range from 101 to 111. The protocols of these children were first analyzed in terms of correctness and conventionalization. The further analysis pertained to processes of signification, grammatic structurization, symbolization, and general factors affecting verbal behavior, viz., rigidity and auto-critical attitude.

I. CORRECTNESS AND CONVENTIONALIZATION

Correctness and conventionalization of word meanings used in given contexts are closely related: if a child gives the "correct" meanings to the artificial words this conveys not only his power of reasoning in terms of logic and experience, but also his mastery of the system of conventional symbols called the English language. Conversely, conventionalization of word meanings within given contexts is not merely a function of socialization of verbal expression but also of reasoning in terms of correctness.

A. Correctness

The achievement scores on the W-C test increase steadily and for the most part significantly from age group to age group. Obversely, of course, the incorrect solutions, grouped together, decrease gradually. The incorrect solutions were divided into "incomplete-final" and "complete-incorrect" solutions. Under incomplete-final solutions were classified those which were offered by the child in spite of his recognition that they fitted only some of the sentences of a series. The incomplete-final solutions, in contradistinction to the rather gradual decrease of the complete-incorrect solutions, decrease sharply and significantly from age group I to age group II, with little change thereafter. These results reflect a young child's lack of recognition of the necessity for integrating, by a single solution, the cues offered by all six sentences. Instead, he seems to take what might be called a "pars-pro-toto" attitude toward the task: he accepts a partial fulfillment of the task for its consummation.

This interpretation is supported by observations of other investigators, e.g. Kurt Gottschaldt. Required to build a tower with wooden blocks reaching to the ceiling, immature children evidenced a pars-pro-toto behavior analogous to the one described here, i.e., they were perfectly satisfied with their work after having constructed only part of the tower (9).

B. Conventionalization: Stereotypy and Versatility

Conventionalization, as an aspect of socialization of language, entails a development away from a private, egocentric word usage toward the handling of language as a means of intercommunication within a given culture. This process reveals itself in the increasing understanding that verbal symbols are standard tokens of communication. Development of standardization or conventionalization of word meanings is here indicated by a decrease in the variability of solutions. As a measure of variability, we utilized the frequency of occurrence within each age group, of the unique and the nonunique end-solutions. Unique solutions were defined as those given by only one child in an age group. A further distinction was made between literally unique (nonunique) and semantically unique (nonunique) solutions: two or more literally unique solutions belonging to one meaning sphere were classified as semantically nonunique, e.g., courage, guts. Only those literally unique solutions were classified as semantically unique which did not share a meaning sphere with other solutions.

As the average number of unique solutions decreases with age, the number of nonunique solutions increases. Moreover, literal uniqueness declines more slowly than semantic uniqueness. This means that, with advancing age, there is an increase in the number of literally unique solutions that fall within the same semantic sphere, i.e., are semantically nonunique.

Thus our data reflect two important aspects of socialization of language behavior. One is the uniformity of language use. The variability in the interpretation of the test sentences, as indicated by the diversity in word solutions, decreases throughout the ages. Unique responses, denoting egocentricity, are increasingly superseded by commonly used solutions. Increase in conventionalization qua stereotypy is but one aspect of this language development. Another aspect concerns a seemingly opposite characteristic of language development, namely, increasing range of synonymity, i.e., versatility: the variety of solutions belonging to one meaning sphere (semantic equivalence) increases.

Ogden and Richards (14, p. 223), more succinctly than other writers, have pointed to this duplicity of language function, namely, (a) symbolic representation of an objective situation, and (b) expression of the speaker's attitude, mood, interest, purpose, desire. The former function is primarily directed toward accuracy, stereotypy of expression, the latter primarily toward appropriate personal selection of words.

As the child grows older the idiosyncratic component of speech due to his individuality or his membership in a special group manifests itself in the particular way he expresses a meaning. As he advances towards maturity he will have at his disposal a greater variety of more or less synonymous expressions from which to choose according to personal predilection, bias, mood, purpose, etc. It may be noted, however, that our test does not lend itself to an exhaustive study of this problem. Since the test as constructed forces a child to find a correct solution, the use of synonymous expressions is necessarily restricted. Nevertheless, within the limitations set by the test, our findings indicate a developmental trend toward an increase of semantically equivalent expressions.

Among the very few experimental studies which have touched upon this problem is the work by E. Gassmann and E. Schmidt (6, p. 143). Their method consisted in the reproduction of sentences of various lengths. Using subjects from 7½ to 13 years of age, they analyzed the deviations in the reproductions from the presented sentences. They found a relative increase of synonyms over meaningless and nonsynonymous substitute words with increase of age.

II. SIGNIFICATION PROCESSES

A process of signification involves the interdependence of word and sentence meaning. In order for the child to signify adequately, he has to comprehend that a word has a relatively stable and self-contained meaning and that it is placed in a sentence which itself has a stable structure. He must further understand that the word and sentence, by being specifically related, form a meaningful whole.

Turning first to the ways in which *word meanings* are handled, we find that at immature levels, the word does not possess the stability, closure and relative independence found in higher semantic activity. It may, therefore, acquire a wide and often diffuse contextual connotation (holophrasis); it may be fused with other concepts (syncresis); its meaning may be readily altered (fluidity).

A. Word-Sentence Fusion and Word-Sentence Embeddedness

A lower degree of semantic stability and independence of word meanings is clearly reflected in the lack of differentiation between word and sentence. This lack of differentiation expresses itself in two ways, viz., *word-sentence fusion* and *word-sentence embeddedness*. In word-sentence fusion, the word meaning becomes identified with the sentential context in toto or in part. Word-sentence embeddedness refers to the fact that the word, in its specific connotation adheres to the context to such a degree that it cannot be lifted out of the sentence.

Two typical forms of signification based on *word-sentence fusion* were found: *sentence-core concepts* and *holophrastic gradients*.

The term sentence-core concept indicates that the meaning of the words essentially comprises the sentence context. After having given a contextual meaning to the artificial word in response to one sentence, the child attempts to find a solution applicable to more than one sentence. Focusing on contextual rather than delimited meanings, the child may not succeed. Often however, he may be able to fit such a core concept, obtained in one sentence, into another sentence by interpreting the latter in such a way that its meaning becomes identical with the core concept (assimilation of sentence meaning, cf. pp. 14, 49).

The *holophrastic gradient* is another indication of the lack of differentiation between word and sentence. Here the concept, rather than being limited to the unknown word, spreads to neighboring parts thus encompassing portions of the sentence (cf. p. 22). In the process of fitting a gradient concept into another sentence, *displacement* may occur, i.e., those neighboring parts that originally formed a portion of the concept may now function as the concept itself.

Forms of signification based on *word-sentence embeddedness* are less immature than those entailing word-sentence fusion; the meaning of a word is relatively circumscribed rather than identical with the context. Nevertheless, once the artificial word has acquired meaning in an individual sentence, it becomes intimately attached to the particular context, thus making it difficult or impossible to modify or replace it as would be necessary for adequate performance.

Three forms of signification based on embeddedness were distinguished: *aggregation of concepts, pluralization* and *transposition*. Among these, *aggregation of individual solutions* is undoubtedly the most primitive. The individual solutions, having

become intrinsic elements of the concrete sentences, cannot be lifted out of their contexts, and consequently cannot be modified; this may lead to the appearance of two or more of such embedded words in a final solution (cf. p. 25).

A *plural concept* possesses two characteristics: (1) it is a concept which, in a vague way, is common to the specific word meanings used for the various test sentences, and (2) the individual word meanings are so specifically fitted into each of the sentences and the final concept is so overgeneral that the latter is incapable of replacing the single solutions. Therefore, the common concept is "pluralized" in order to fit into the various sentences (cf. p. 30).

Thus, whereas in an aggregative solution the various specific solutions are clustered or fused, the plural concept indicates some sort of classificatory (presubsumptive) activity. Logically, as well as genetically, a plural concept occupies an intermediate position between an aggregative and a truly generalized solution.

Akin to pluralization is the process of *transposition.* Here again, the child does not use an over-all concept that can be directly applied to the individual sentences; as in pluralization, he employs specific concrete solutions for the sentences. The over-all solution is not however, as in pluralization, an overgeneral concept, but a concept that has been formed for one individual sentence. Transposition consists, then, in the retention of a concrete concept A, obtained in one sentence, with all further specific solutions B,C,D . . . . equated with it ("B is a sort of A, C is a sort of A," etc.). In this way the child attains an over-all solution without being obliged to surrender the single solutions specifically fitting into each sentence (cf. p. 32).

The statistical data on word-sentence fusion and word-sentence embeddedness confirm the psychological analysis: (1) the greater primitivity of signification based on word-sentence fusion (core-conceptualization including assimilation, and holophrastic gradients) compared with signification based on word-sentence embeddedness is clearly reflected in the numerical results. Core concepts and gradients decrease noticeably between age groups I-II and II-III, with practically no occurrence at levels IV and V. Core concepts proper, i.e., those based on word-sentence fusion to such a high degree that no over-all signification can occur, show the greatest drop between level I and level II with almost no incidence thereafter. (2) The statistical data on aggregation, pluralization and transposition indicate that these processes are developmentally on a higher level.

Aggregation, pluralization, and transposition all increase, although insignificantly, from I to II; aggregation practically disappears after III while pluralization and transposition show an oscillating downward trend. These data justify the conclusion that aggregation of concepts is a more primitive form of synthesis than pluralization and transposition.

B. Nonsentential Holophrastic, Syncretic and Fluidic Concepts

Underlying the aforementioned processes of signification is a holophrastic comprehension of word meaning based on the intimate linkage between word and sentence. There are other types of concepts which, although not involving word-sentence fusion or embeddedness, do not possess the semantic closure and stability of mature verbal solutions. We have distinguished *nonsentential holophrastic, syncretic* and generally *fluidic* word meanings.

1. *Nonsentential holophrastic concepts* are characterized by wide contextual connotation. In contradistinction to sentence core concepts, however, their contextual meaning is not identical with that of the sentence. A holophrastic word meaning may be explicitly stated in terms of a phrase, denoting a situation, or may be indicated by a single word, which on probing is found to have a wide contextual connotation (cf. p. 37). Based on the holophrastic view of word meanings are processes of signification of which the most important are *synecdoche, holophrastic concretization, juxtaposition and chain.*

In synecdochal signification, the over-all solution includes a broad global situation, of which any part may be used to signify the word. *Holophrastic concretization* consists in the application of the meaning of a word to a new sentence by the addition of qualifying elements (cf. p. 40 and p. 41).

Signification by *juxtaposition* and by *chain* are also essentially holophrastic in nature; probably at the base of these forms of signification is a pars-pro-toto conception. In the case of *juxtaposition,* after having formed a concept of an object in one sentence, the child appends to the object concrete parts, that he now employs as a new concept for the second sentence. This new concept serves as a mediator which permits the application of the original concept in the new sentence. For instance, a child has developed the concept "door" for CORPLUM in sentence 2 of series I: A "door" MAY BE USED TO CLOSE OFF AN OPEN PLACE. "Door" cannot be directly employed in the sentence A CORPLUM MAY BE USED FOR SUPPORT; however, when a "ledge" is appended to the "door," the con-

cept is applicable through the mediation of the juxtaposed part: "A 'ledge'" (put on the door) "can be used for support —you can lean on it—so 'door' fits." The child is satisfied with "door" as an over-all concept apparently because "ledge" is seen as a pars-pro-toto representative of the holophrastic concept "door+ledge."

A similar mechanism seems to be operative in signification by *chain*. Here the respective objects are connected not in terms of spatial contiguity but stand in a temporal relationship such as cause and effect, etc. Therefore, a concept, A (courage), for one sentence fits another sentence if the concept B (fight), adequate for the second sentence, stands to A in the relation of effect to cause ("If you have courage you can fight").

Thus far our analysis has disclosed two principal types of holophrastic conceptualization that involve broad contexts, namely those based on word-sentence fusion (core-concepts, gradients) and those nonsentential in character. It seems worthwhile to discuss the genetic relationship between these two.

A clearcut developmental difference between the two types becomes apparent from the statistical analysis. Both sentential and nonsentential holophrastic concepts show a considerable, although not significant, decrease in mean occurrence between I and II, and a significant drop between II and III. At level III, however, the picture changes. The incidence of sentential holophrasis here dwindles to a mean occurrence of 1.28 as compared with the mean number of nonsentential holophrastic concepts of 7.04. Moreover, there is practically no incidence of sentential holophrasis after level III, while at level IV, there is still a mean incidence of 4.56 nonsentential holophrastic concepts. The persistence of nonsentential holophrastic concepts throughout the ages, in contradistinction to sentential holophrasis is also evidenced by the use of such concepts by practically all the children of the older age groups.

In sum, these data reflect the much greater primitivity of sentential in comparison with nonsentential holophrasis (Table XVII).

TABLE XVII

SENTENCE-CONTEXT-BOUND VS. SENTENCE-CONTEXT-FREE HOLOPHRASTIC WORD MEANINGS (MEAN OCCURRENCE PER CHILD)

Age Group	I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)
Sentential Holophrasis	10.76	7.40	1.28	0.28	0.32
Non-sentential Holophrasis	11.72	10.80	7.04	4.56	3.28

2. *Syncretic concepts,* while not holophrastic in nature, also reflect an immature type of conceptualization, lacking stability and closure. The term syncresis refers to a fusion of qualities which in mature thought are discrete and incompatible. The child may, for example, denote by the same word both the subjective and objective aspects of a situation. The same verb form may perhaps express active and passive relationships; a noun may be used to indicate opposite meanings (A and not-A) etc. (cf. p. 42). Thus the child may use incongruous or contradictory meanings in two different sentences and yet be convinced that these meanings belong to the same conceptual sphere of the word. Syncretic concepts steadily decrease through the ages with a significant drop between the second and third levels.

3. *Fluidic concepts* also reflect immature conceptualization, without necessarily involving either holophrasis or syncresis. After having formed a concept in one sentence, the child may vary its meaning by the addition of elements which conventionally would not be included. He may extend the concept to comprise a farfetched metaphorical connotation (as for example applying the concept of "sickness" to a deteriorating house). Such fluidic concepts were found to decrease only slightly with age.

Summing up the analysis concerning signification of words, we found four main characteristics of semantic immaturity, viz., holophrasis, concrete embeddedness, syncresis and fluidity of word meanings. On the basis of the statistical findings the following developmental relationships seem to exist between these forms.

Two forms of holophrasis could be distinguished, sentential and nonsentential. Sentential holophrasis appears to be a most immature type of signification; its early sharp decline brings into relief the great primitivity of signification based on word-sentence fusion. Nonsentential holophrasis by comparison is less immature. Though it definitely decreases throughout the ages one notes that hardly any protocol of the subjects is entirely free of holophrastic concepts.

The analysis of embeddedness also yields two levels of immaturity: aggregation of solutions the more primitive, pluralization and transposition the less immature. Though, on the whole, concrete word-embeddedness is less primitive than sentential holophrasis, its relation to nonsentential holophrasis is not as clearcut. Pluralization, transposition, and aggregative concepts all rise from group I to group II, but in contrast to the plural and

transposed concepts, aggregative concepts decline sharply from there on. Thus aggregation of solutions seems to occupy a genetic position not much higher than sentential holophrasis, whereas pluralization and transposition are much farther advanced.

If one were to examine the mean frequency of syncresis and simple holophrasis at the early age levels, one would observe that holophrasis occurs more frequently than syncresis. To conclude from this observation that holophrasis is more primitive than syncresis seems to be unwarranted in the light of the complete developmental curves; for we note that whereas simple holophrasis only gradually and slowly decreases, syncresis abruptly disappears after the third level. We are, therefore, probably correct in arguing that simple holophrasis is less immature than syncresis.

Nonsyncretic and nonholophrastic fluidic concepts maintain their frequency of occurrence with little change throughout the age groups. This indicates that, compared with holophrastic as well as syncretic forms, fluidity is probably the least immature of the characteristics accompanying signification which have been heretofore considered.

We might add that the differences in the level of immaturity of the various types of conceptualization brought out in our study of children are elucidated in an investigation in which this test was used with educated adults (12). Simple holophrasis, embeddedness, fluidity, while infrequent, still occurred with educated adults, whereas core conceptualization and holophrastic gradients were nonexistent.

C. Interpretation of Sentences

For younger children a sentence does not possess the structural stability which it has for the older children. This instability is reflected in the manipulation of sentence meanings in order to make a concept applicable. Basically, sentence meanings were modified in three ways: (a) *assimilation of sentence meanings*—after having found a concept adequate for one sentence, the child interprets another sentence as being identical with the first (cf. p. 49); (b) *contamination of sentence meanings*—after having found a concept for a sentence, the child transports part of that context to another sentence, and thus the concept is made to apply to the augmented sentence (cf. p. 50); (c) *egocentric, imaginative handling of sentence meanings*—in the process of forming a concept, the child interprets the sentence context in terms of personal experiences, etc., by stressing, adding or eliminating some elements of the sentence (cf. p. 51).

A statistical comparison of these three processes shows the following developmental changes: assimilation as well as sen-

tence contamination drops sharply after the second level; both processes almost disappear after the third level. On the other hand, the concrete-, imaginative- and egocentric interpretations of sentences decline gradually, with significant decreases from level to level (except between II and III); there is still a considerable incidence of these responses at level V. These results indicate a relatively greater immaturity of sentence assimilation and sentence contamination as compared with egocentric and imaginative interpretations.

One might note the genetically close correspondence between processes involved in the signification of both words and sentences. Those processes expressing the greatest lack in stability and closure show a significantly early decrease with almost no manifestation on the last two levels.

III. GRAMMATIZATION

Meanings are expressed and formally structured through the linguistic medium. The structural articulation of word and sentence is the external aspect of a differentiation between word and sentence meaning. Hence, processes of immature signification are, in general, closely linked to (1) lack in lexicalization, i.e., lack in the grammatical distinction of a word from a larger linguistic unit, and (2) lack of stability and definiteness of syntactic structure.

A. Lexicalization

Required by the test is a comprehension of the word as a lexical entity, i.e., a self-contained, formal unit imbued with a definite circumscribed meaning. The young child's difficulty in lifting the word, as an articulate unit, out of the sentence has been amply demonstrated in our study. It is indicated by: the inability in defining the word without repetition of the entire sentence (seemingly tautological statements) (cf. p. 55); the difficulties in offering an explicit over-all meaning despite the ability in fitting one concept into each of the individual sentences (cf. p. 56); the formation of sentence-core concepts showing lack of comprehension of the nature of the word as occupying a definite place in the sentence configuration (cf. p. 55); the frequent occurrence of holophrastic gradients, whereby neighboring parts within the sentence adhere to the word (cf. p. 56); and finally, the difficulty in comprehending the semantic identity of a word when placed into two different sentences (cf. p. 56).

B. Syntactic Structurization

The test also requires the comprehension of the sentence as a definite and closed structure. The young child, viewing the sentence as a more or less fluid form, may readily alter it while in the process of signifying the word. Such alterations of the sentence vary from a slight change of order to a radical reformulation. It is this fluidity and openness of sentence structure which makes possible extensive semantic transformations, e.g., assimilative reinterpretation of sentence meaning (cf. p. 57). The contamination of portions of two sentences, discussed above, is of course germane to the grammatical aspect of the sentence as it is to the semantic. In addition to radical changes of given sentences one also finds less severe alterations which consist of shifts in the word order, some modification in the position of phrases within the sentences, etc. Particularly frequent are slight changes concerning abstract words such as auxiliary verbs, prepositions, conjunctions, etc., (cf. p. 58).

It is apparent from the statistical analysis that the more radical alterations of the sentence structure (molding, sentence-contamination) are most frequent with the younger children and practically disappear after the third level. The less severe grammatical changes, although appreciably decreasing in successive age groups, disappear relatively late (after level IV). These facts evidence the growth in the stability and closure of sentence structure as a function of age.

C. Relation of Lexicalization and Syntactic Structurization

Since grammatization consists in the differentiation between word and sentence, one would expect lexicalization and syntactic structurization to be developmentally interrelated. An inspection of the statistical data confirms this expectation. Signs of immaturity for both forms of grammatization decline at similar rates, with the most conspicuous drops between group II and group III, and little occurrence after level III.

For a more detailed comparison the signs indicating most severe immaturity in lexicalization and in syntactic structurization were selected. A correlation of the mean frequency of core conceptualization with that of sentence contamination and molding yields the following results: respectively, the correlation coefficients for groups I, II, III, IV and V are .72, .63, .52, .42, and -.11. With the exception of the last one all r's are significant (the first three significant at the .01 level, the fourth significant at the .02 level). Of particular interest are the relatively high correlations for groups I and II, since only with

these two age groups are the occurrences sufficiently frequent for the r's to be psychologically meaningful.

D. Relation of Grammatization to Signification

One of the most important but rarely explored problems of language development concerns the relationship between the semantic and grammatical aspects of language. Some of our results seem to be relevant to this problem.

The signs indicating greatest immaturity of grammatization are found to be most common with the younger children. The significant developmental changes in mean frequency of these indicators occur between age groups II and III. Grammatical alterations exhibited by older children are milder sentence changes of word position, etc. Similarly, as we have seen above, those signs indicating greatest immaturity of signification (word-sentence fusion, solution aggregation, word syncresis) decline mainly and significantly from group II to group III, with little manifestation thereafter.

This similarity in the genetic changes of signification and grammatization lends support to the assumption of a developmental interdependence of meaning and structure.

IV. SYMBOLIZATION

A verbal symbol, whether word or sentence, is a sign standing for or referring to an object, a situation, a logical relation, etc. To use Ogden and Richards' terminology, a symbol stands for a "referent" (14). The relation between symbol and referent may be direct or indirect depending upon the developmental or cultural level, the level of social intercourse, etc., of the individuals involved. Studies in child psychology, ethnology, and psychopathology have demonstrated that at primitive levels, symbol and referent are treated as directly related; the word is there comprehended as intrinsically displaying the meaning. "Physiognomic language" (28, p. 254), "word magic" (28, p. 255), "word realism" (16, ch. 2), etc., represent forms of this internal relationship between word and referent. The word is perceived as a sound pattern ("natural symbol") which depicts the object in a manner analogous to a drawing. Onomatopoetic words, used in languages of advanced cultures, are special instances of physiognomic speech.

Usually, however, the relation between symbol and referent is indirect: the word is a sign conventionally used to stand for a referent; "dog" in one language, "chien" in another, is applied

whenever we refer to a certain animal. We may adapt the conceptual scheme of Ogden and Richards for the purpose of graphically presenting the varying relations that exist between Thought (Act of Reference), Symbol, and Referent (Fig. 3).

The direct connection between Symbol and Referent existing at early language stages is represented by a solid line in Diagram 1; the indirect relation between Symbol and Referent of conventionalized speech is represented by a broken line in Diagram 2.

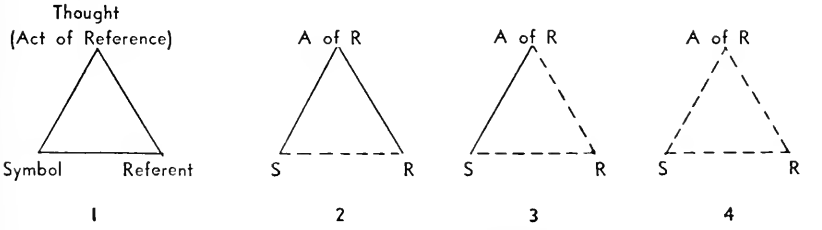


Figure 3. Relation between Thought (Act of Reference), Symbol, Referent

The Act of Reference consists in thinking-about-a-referent by means of a verbal symbol. The thinking-about-a-referent may be more or less direct and concrete: the reference may be made with respect to a real object or a situation which one may see or imagine. On the other hand, the referent, instead of being a real object, may be a generic concept of which the object is an instance. In the psychopathological literature, cases of aphasia have been described, illustrating quite impressively the "regression" of brain-injured patients to a stage where the categorial attitude has been impaired. These patients, although perfectly able to name individual things and situations, have difficulty in denoting categorially (e.g., in naming a color category, such as blue or red when asked the color of a blue or red object (8).

Again, an indirect, nonconcrete act of reference occurs in the treatment of situations in terms of possibility rather than actuality. An adequate attitude toward a verbal test such as ours involves the understanding that the test sentences do not denote information about actual events—they are statements not concerned with the sphere of actuality. A deficiency in taking a hypothetical attitude is often found among brain-injured patients. A patient of Goldstein's could not repeat the sentence, "It is raining today," because he observed the sun shining outside. The lack of a hypothetical attitude has been witnessed frequently in young children as well as mentally retarded persons. A six-year-old child objected to answering the question, "If you have a brother who is one year older than you, how old is he?" on the grounds that he had no brother (28, p. 313).

Diagram 3 depicts the indirect, nonconcrete Act of Reference (categorial, hypothetical attitude, etc.) by a broken line between Thought and Referent.

Finally, one should note that the relationship between Thought and Symbol, although usually a direct one, can also be indirect. Instead of using the "correct" expression, one may employ an indirect, metaphorical one. Such an indirect relationship is indicated in Diagram 4 by the broken line between Thought and Symbol. Truly metaphorical expressions (such as are used by adults, particularly by poets, scientists, etc.) represent stages that are genetically above concrete symbolism. Young children, on the other hand, take metaphors literally. Likewise, organically impaired patients are incapable of grasping the metaphorical character of proverbial sayings or poetical phrases.

In sum, verbal symbolism exists in varying degrees of abstractness, Diagram 1 representing the most concrete, Diagram 4 the most abstract form of symbolic behavior.

In our test situation, concrete symbolism manifested itself in two forms: *sentence realism* and *homophonic word symbolism*. Concrete symbolization of sentences is characterized by the fact that the hypothetical, abstract nature of the test sentences is not grasped. The child assumes that the sentences contain information about real events. Consequently, he attempts to evaluate them as to truth or conformance with personal experience, etc. Homophonic word symbolism involves a lack of differentiation between meaning and sound pattern. The child apprehends a sound pattern as imbued with meaning rather than as a symbol that is used conventionally to represent an object, action or relation. It appears that a special instance of homophonic word symbolism is the use of the artificial word without regard to a definite referent: *neologic word symbolism*. The reason for including neologic word symbolism under homophonic word symbolism is that the child perceives the sound pattern of an artificial word as a sufficient determinant of the meaning, thus permitting its use as part of the sentence without any further attempt at signification.

The statistical results indicate that the mean frequency of concrete symbolization decreases chiefly through the first three levels. There are very few instances of this type of symbolization at the last two levels. This trend is also found with regard to the percentage of children demonstrating concrete symbolism. Eighty per cent of the children of the first two age groups show signs of such symbolism, whereas less than one-third of the

children at the last two age levels manifest some lack in adequate symbolism.

V. RIGIDITY, FLEXIBILITY AND AUTOCRITICISM

Among the general developmental characteristics of test-solving behavior observed here, the most important was the degree of rigidity and flexibility, including autocriticism.

In the developmental changes from rigid to flexible behavior, autocriticism is intrinsically involved. In giving signification to an unknown word the child is usually required to critically evaluate an already formed solution in the light of new cues from subsequent sentences. There are several reasons, however, why autocriticism has been treated as a separate category in our analysis. Firstly, lack of autocriticism is not the only, not even the principal cause of rigidity; autocriticism may coexist with rigid behavior, and a performance may be flexible without autocritical attitude. Secondly, although it is true that any lack of flexible behavior, as well as of autocriticism, is an expression of undifferentiatedness of functioning, rigidity and flexibility refer to characteristics of performance, while autocriticism pertains to characteristics of ego-task relationships. A basic form of rigidity—as previous studies have shown (26)—is due to a lack in the cognitive (perceptual-motor, etc.) articulation. For instance, if the word meaning is not separated as an entity from the context of a sentence, it cannot be extracted, and thus modified, replaced, etc. in the light of other contexts. Lack in autocriticism, on the other hand, is essentially based on a low degree of differentiation between ego and task. The distance between the self and one's own performance has to be sufficiently wide to permit an objective evaluation of solutions.

A. Forms of Rigid Language Behavior

Rigid verbal behavior expressed itself in our test in several forms: (a) One-solution Rigidity—a solution once attained for a sentence is adhered to and cannot be modified for that sentence. Though the solution may be deemed inadequate for the other sentences it is retained as the solution for the particular sentence it fits; (b) Two-solution Rigidity — two distinct solutions, fitting two specific sentences, are rigidly retained, thus precluding an over-all concept; (c) No-solution Rigidity—a solution applied to a number of sentences which does not fit a new sentence, blocks the formation of any concepts for that sentence; (d) Perseveration — a solution or a sentence-context from a previous test series is carried over to a subsequent

series; (e) Forcing a Solution—a preconceived solution is adhered to by the child, who manages to fit it into several sentences by means of farfetched associations, manipulations of the sentence, etc.

It seems feasible to arrange these five forms of rigid conceptualization into two groups: one comprising b, c, and d; the other a and e. With respect to types b, c, and d, one can be reasonably certain that the principal factor causing the rigid performance is the strong embeddedness of the particular solution in the sentence context. This condition may be called "primary verbal rigidity." With respect to forms a and e, underlying conditions are probably more complex. If a subject forces a solution, this may be caused by various factors, of which primary verbal rigidity is only one. Forcing, as it appears in the protocols of older children, seems to be due frequently to such factors as a felt pressure to solve the problem despite the lack of an adequate solution, the necessity to maintain personal prestige, the desire to test out a solution as far as possible, emotional block, etc. Forcing has many degrees. In its milder forms, it is found occasionally even in the protocols of educated adults. Again, if a subject offers an isolated solution (a), a primary rigidity may be the reason, just as it is with (b), but it might also be that he cannot proceed to a more comprehensive concept because of the secondary factors mentioned above.

The statistical findings seem to us to justify the distinction made between responses mainly based on primary verbal rigidity and those where the primary rigidity factors are interwoven with secondary determinants. Responses due mainly to primary rigidity (b, c, d) significantly decrease between level I and level II, with slight occurrence thereafter. Signs of One-Solution Rigidity, although significantly decreasing from I to II, are still prevalent among the higher age groups. Forcing remains quite high in frequency throughout the first four age levels, decreasing noticeably only between level IV and level V.

B. Autocriticism

The developmental changes in the autocritical attitude have been analyzed in terms of the overt remarks referring to a critical evaluation of one's own performance. Instances of critical evaluation at the first two age levels are few; they increase sharply and significantly from level II to level III with little change thereafter.

Differences between age groups are, however, not entirely limited to quantitative ones. There is also a genetic difference in the kind of critical evaluation. The younger children's crit-

ical remarks are directed mainly toward their grossly immature processes, such as severe grammatical alteration of the test sentence. The older children show sensitivity to verbal responses of a lesser degree of immaturity, e.g. farfetched responses, holophrastic concretization, etc.

A further genetic difference concerns the efficacy of autocriticism: the younger children, in spite of their awareness of having made an inadequate response, ordinarily retain the response rigidly; the older children, in contradistinction, generally reject such solutions.

C. Flexibility and Symbolic Behavior

Developmental theory and general analysis of language behavior leads to the conclusion of a close relationship between levels of symbolism and degrees of flexible behavior. Verbal flexibility as required by our test presupposes a more or less abstract-symbolic attitude toward language; concrete symbolism impedes flexible verbal behavior. The child ascends to a more mature task-attitude when he conceives of a solution as provisional or tentative, i.e., when he keeps a concept in abeyance until it is confirmed or rejected by the cues from the subsequent contexts. Concrete symbolism, by its very nature, excludes this attitude of tentativeness. A solution, once conceived, necessarily becomes fixed if viewed as an integral part of a context, referring to an actual event. Confronted with one of the sentences, the young child doesn't ask himself "What *may* this word mean here," and "is it possible to fit it into that other sentence too?" but "what *does* this word mean here?"

Our assumption of an inner relationship between rigid behavior and concrete symbolization seems justified by statistical evidence. Both "primary verbal rigidity" and sentence realism drop significantly from group I to group II, with little occurrence thereafter.

Similarly, one would expect autocriticism and symbolization to be closely related. Psychological reasons for an intimate connection between the development of ego-task relationships and stages of symbolic behavior are quite obvious: primitive forms of symbolic behavior are as much concrete as they are egocentric. The test sentences, maturely conceived, are viewed as ideal, timeless events, whereas, at the concretely symbolic level, they are dealt with as actual happenings, localized within the life space of the child. Autocriticism, likewise, presupposes freedom from egocentric involvement. Only when the distance between ego and task has become sufficiently wide can one critically evaluate one's own achievement.

A valuable insight into these relationships can be gained from a comparison of the normative criticism of an early stage of concrete symbolism with the autocriticism that presupposes a more abstract symbolic attitude.

As discussed previously, normative treatment of the test sentences expresses itself in the critical evaluation of the content in terms of compatibility with one's own experience, social-moral acceptability, etc. To cite a previously given example—a child reports after reading sentence 2 of series III, THE MORE YOU TAKE OUT OF A CONTAVISH THE LARGER IT GETS: "The more you take out the less you get, not more! that's wrong in the sentence—it gets less." The child conceives of this sentence as conveying information which does not concur with his personal experience. The inability of the child to grasp the hypothetico-abstract nature of the sentence leads to a normative evaluation and prevents him consequently from focusing on the task proper.

The change from such normative criticism of the sentence content to a criticism of one's own solutions entails a remarkable advance. Not before a hypothetical attitude toward the test sentence is fully established can one expect autocriticism to take its effect. As one will recall, younger children, even in those few instances where they showed an autocritical attitude, did not subsequently alter their performance. In other words, despite being aware of making improper grammatical alterations or syntactical changes, they retained their responses. The older children, although they might observe the possibility of fitting a solution if certain grammatical changes were made, tended to reject this immature approach.

The assumption has been made here that the development of hypothetical attitudes logically precedes the full emergence of autocritical behavior. If this assumption is valid, it might explain why—in contradistinction to the close statistical relationship between symbolization and rigidity—the significant drop in sentence realism precedes, rather than coexists with, the significant rise of autocriticism (cf. Tables XIII a. XV).

VI. CONCLUSION: SALTATORY VERSUS GRADUAL DEVELOPMENTAL CHANGES

Developmental psychologists, in agreement with views held by developmental biologists, are becoming increasingly aware of evidence in support of the conception of saltatory changes during growth. Though not denying the existence of gradual changes, they insist that saltation is an important characteristic of mental development.

In order to analyze the data more comprehensively in regard to the gradualness-saltation controversy, the diagrammatic Table XVIII was constructed.

TABLE XVIII

NOTICEABLE DEVELOPMENTAL DECREASES IN MEAN FREQUENCY
(Sig indicates significant drop, X indicates noticeable but nonsignificant decline)

	AGE GROUPS			
	I-II (9-10 yrs.)	II-III (10-11 yrs.)	III-IV (11-12 yrs.)	IV-V (12-13 yrs.)
Word-Signif.				
Sentence Core Concept	Sig	X		
Assimilation		Sig		
Gradient	X	Sig		
Solution Aggregate		Sig		
Nonsentential Holophrasis	X	Sig	X	X
Word Syncresis		Sig		
Fluid Modification			Sig	
Vague Conception			Sig	
Sentence Interpret.				
Assimilation		Sig		
Sentence Contamination		Sig		
Egoc.-Imag. Interpretation	Sig		Sig	Sig
Sentence Struct.				
Sentence Contamination		Sig		
Molding	X	Sig		
Mild Grammatical Change	X	Sig		X
Symbol.				
Homophonic Symbolism		Sig		
Sentence Realism	Sig		Sig	
Rigidity				
Primary Rigidity	Sig			
Rigidity, Prim. and Second.	Sig		X	Sig

This table depicts approximately the characteristic developmental declines of immature processes in terms of their mean frequencies. Since Assimilation and Sentence Contamination both appear twice under two different headings the diagram of 18 items includes 16 different processes.

A. GRADUALNESS AND SALTATION WITH REGARD TO DEGREE OF IMMATURITY

One notes that processes which were assumed to be of a low genetic order practically stop with the third age level. These include: word signification based on a lack of differentiation between word and sentence; word syncresis; gross distortions of sentence meaning due to assimilation and contamination; gross distortion of sentence structure; homophonic symbolization; primary rigidity. Sentence Realism is the only primitive sign that deviates somewhat from expectation.

Processes assumed to be of a "medium" genetic order present a different picture. Whereas the most immature processes practically have disappeared after the third level, decline of the medium processes is of a more gradual nature. That is, it extends over four or all five levels. These processes include: nonsentential holophrastic conceptualization (simple holophrasis and holophrastic concretization); sentence interpretation in terms of egocentric-imaginative association; mild structural changes of the sentences; secondary rigidity.

The two least immature signs of signification—fluidity and vagueness—decline later, and again rather abruptly. Their decline involves only higher age groups.

From this analysis we may conclude that the data give evidence of saltatory as well as gradual changes. The evidence in favor of saltatory changes is particularly impressive. Though there is a general decline throughout the ages, the decreases appear to be predominantly saltatory. Continuous change seems to be the mark of processes of a comparatively mild degree of immaturity; the processes of genetically low order and the least immature processes decline in a saltatory manner.

B. Age Levels of Saltatory Changes with Regard to Types of Processes

The clusters of processes participating in saltation at different age ranges can be observed from the diagram. There are three age ranges at which developmental changes of several processes occur in a rather saltatory fshion, viz., between age group I and II, II and III, and III and IV. An attempt has been made to interpret particularly the saltatory changes I-II and II-III with reference to the type of processes involved.

Comparatively few of the genetically low processes participate in the abrupt and significant changes between group I and II. Among the signification processes proper, only one, viz., core conceptualization demonstrates this early decrease. Involved in the early decline are two further signs of language behavior of a more general nature, viz., sentence realism and primary rigidity. Of these three processes, sentence realism is the only one that later on, between levels III and IV, evidences again a significant, though small decrease.

These early declining signs of immature language behavior seem to have a common denominator; they each convey a lack of certain language attitudes that are basic for an adequate manipulation of the test. Sentence-core conceptualization, because it pertains to one context only, conveys—in contradistinction to

other sentential holophrastic forms—a lack of synthetic operation, that is, of apprehending the articifial word in its relation to the various sentences of a series; primary rigidity militates against synthesis because it isolates or accentuates individual sentences with their specific solutions; concrete symbolism involves a lack of recognition of the nature of the test—it is contrary to a hypothetical attitude without which one cannot adequately signify.

It seems appropriate to add to these early declining signs of immature language behavior one that has been discussed before and which is of a still more general nature, viz., the "pars-pro-toto attitude." This attitude, as one will recall, expressed itself in the readiness of the child to accept a solution for only some of the sentences as representative of the entire series (incomplete-final solutions). It is important to note that there was a significant decrease of these incomplete-final solutions again between group I and II with little changes thereafter (cf. p. 10).

Between age groups II and III most decisive changes occur. Of the sixteen processes represented, nine evidence here a significant change, none of them at any other age levels. With the exception of sentence-core concepts, they include all the processes that are concerned with genetically low forms of signification.

These results strongly suggest that around the ten to eleven year range signification behavior undergoes a rather abrupt development. Validation of such an assumption must depend on the support from other studies dealing with various aspects of mental, particularly conceptual, growth. Results from three studies on conceptual development may be mentioned that are the more impressive as the authors did not discuss saltatory changes and apparently were not aware of this problem. The earliest of these studies is the well-known investigation by Barnes (2) who tabulated children's definitions in terms of concrete action. With the age groups comparable to ours, a sharp decrease of the primitive form of definition occurred between 10 and 11 years, as follows:

Age	8	9	10	11	12	13	14
Concrete Action (in per cent)	73	68	62	48	47	37	41

A second study to be mentioned is that by Beckmann (4), who determined the percentage of abstract words used in the description of pictures. Again, a noticeable increase of the percentage of abstract terms between years 10 and 11 is observable:

Age	8	9	10	11	12	13
Abstract Terms (in per cent)	1.2	2.1	2.7	5.5	5.5	5.7

In a third investigation, by Vogel (24), children were asked to respond to single stimulus words by offering sentences that contained the particular word. The children were divided into three age groups: 7-9, 10-11, 12-14, and the responses analyzed under various aspects. Some of the developmental changes were gradual; however, it is particularly revelant for our problem that there was definite saltation with respect to subsumptive activity. Vogel calculated the relationship of frequency of vague, overgeneral concepts (a watch is a *thing* that tells time) versus the use of more specific concepts (a watch is a little *machine* that tells time). His findings are summarized in Table XIX, first line.

TABLE XIX

RATIOS OF FREQUENCIES OF VAGUE TO SPECIFIC CONCEPTS, AND OF ANIMATE TO INANIMATE CONCEPTS FOR VARIOUS AGE GROUPS*

Age Range	7-9	10-11	12-14
Vague vs. Specific	43/0=43.0	56/38=1.5	104/97=1.1
Animate vs. Inanimate	42/0=42.0	72/22=3.3	145/56=2.6

* Vogel, J. Untersuchungen ueber die Denkbeziehungen in den Urteilen des Schulkindes. Ph.D. Thesis, Giessen, 1911.

Table XIX, second line, refers to the distribution of subsumptive responses in regard to stimulus words that indicate animate or inanimate objects. Examples of subsumptive responses are: stimulus word, mother (animate): mother is a woman; stimulus word, watch (inanimate): watch is a thing. Both tabulations indicate a tremendous and abrupt developmental change at 10-11 years.

Thus, though the results of the three studies have come from entirely different sources and were undertaken for very different aims, all suggest developmental saltation at approximately the same ages at which most of the abrupt changes occurred on the W-C test.

C. Developmental Shifts

The demonstration of saltatory changes is in support of the modern view of mental reorganization occurring during development. Equally in line with this theoretical position is the accumulation of facts, pointing to a shift of dominance of processes taking place during ontogenesis. Mental growth, rather than being conceived as a straight increase of achievement is here seen as a sequence of rises and declines of processes, subserving such achievement. During development, functions dominant at earlier stages become superseded by functions of a higher order (28, p. 56b).

Since the task of the W-C test essentially involves the handling of cues from various contexts to achieve a synthetic product (the over-all concept), it seems fruitful to inspect more closely those processes that are directly concerned with synthesis. The processes are: assimilation, gradients; aggregation of solutions, pluralization and transposition; synecdoche, holophrastic concretization, chain and juxtaposition; word syncresis.

The first two processes of synthesis based on word-sentence fusion (A-Processes) decline, although not significantly, from I to II. Each of the other eight processes shows an *increase* from group I to group II, followed by a decline—mostly significant—from group II to group III; the increase from I to II, though slight for the individual processes, is almost significant at the .05 level of confidence when the processes are considered collectively (B-Processes) (Table XX).

TABLE XX

PRIMITIVE CONCEPTUAL SYNTHESIS: MEAN FREQUENCY

	Age Group				
	I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)
A-Processes*	8.00	6.40	1.04	0.08	0.24
B-Processes**	8.24	11.36	5.48	4.56	3.16

* A-Processes are synthesis-processes based on Word-Sentence Fusion, viz., Assimilation and Gradients.

** B-Processes are synthesis-processes not based on Word-Sentence Fusion, viz., Aggregation of Solutions, Pluralization, Transposition, Synecdoche, Holophrastic Concretization, Chain, Juxtaposition and Word Syncresis.

The results of this analysis support the assumption of developmental shifts. They indicate an early growth of primitive processes which carry the task of synthesis (B-Processes). After having reached a peak, these processes decline and are supplanted by higher processes, essentially subsumptive in nature (see Part V of Section III).

In closing this section on general developmental trends, the following conclusions may be formulated:

(a) There is, with increasing age, a gradual increase in performance, indicated by the achievement scores of correctness. However, the various processes that underlie the performance do not altogether change gradually from immature to more mature ones. Some of the immature processes decrease rather evenly, the majority of them decrease abruptly.

(b) There is an early abrupt decline of signs of immaturity in those verbal operations that are basic for an adequate orientation toward the test (lack of synthetically relating the various contexts; concrete, nonhypothetical symbolization; pars-pro-toto attitude).

(c) The process patterns of signification proper undergo a most decisive change approximately around 10 to 11 years of age. Between groups II and III there is an abrupt decline of immature processes of signification that suggest a qualitative reorganization of language behavior at that age.

(d) Reorganization of language behavior is indicated further by the shift of functions that partake in development. Primitive processes subserving synthesis rise at early levels and then decline being superseded by functions of a higher order.

Section Three

IMMATURE LANGUAGE BEHAVIOR ON THE W-C TEST AND GENERAL LANGUAGE DEVELOPMENT

I. THE CONCEPT OF DEVELOPMENTAL LEVEL

The child's attempt to give signification to an unknown word elicits a great variety of intellectual operations that, with increasing age, shift from primitive to more mature forms. The question can be asked—as it has been asked with regard to other studies testing intellectual development: how much are our results a function of the difficulty of the task rather than generally characteristic of a mental level? Do children while acquiring language in ordinary life situations exhibit similar processes? An adequate answer to these questions can be given only within a relatively broad frame of reference.

Much of the earlier controversy concerning the interpretation of results of genetic experiments seems to stem from certain misconceptions of the term "developmental level." Many developmental psychologists of today will probably admit that there are three fallacies involved, viz.: (1) development is marked by a straight upward trend; (2) the level of achievement is a direct measure of the level of underlying functions; (3) the maturity level of an individual or a group is a fixed level of operation. In contradistinction to these statements the following three principles may be formulated, viz.:

(1) the principle of spiral development
(2) the genetic principle of analogous functioning
(3) the genetic principle of functional variability and stability.

A. Spiral Development

Development must not be conceived as a straight upward trend. At any stage of maturity the level of performance depends on the relative novelty of the task. If the child meets with a new task he may recede partially to a lower level of functioning already abandoned in the achievement of familiar tasks. Gesell (7) demonstrated such "spiral development" in locomotor behavior: as the child progresses from a lower to a higher plane of locomotion, at first he reverts partially to less mature behavior.[2] Spirality of language development has been noticed by students of child behavior. O'Shea, for instance, in a book on *Linguistic Development and Education* observed

[2]For instance, he reverts from an asymmetric motion already achieved in crawling to a primitive symmetric motion in creeping.

that egocentrically conceived words, indefinite from the hearer's point of view, decline developmentally but may reappear at higher planes of verbal activity. "The speech of children from four onward for a few years is marked by general expressions that must be in part the result of nonspecialized imaging. As development proceeds, these indefinite expressions are heard less and less frequently in ordinary discussion though they reappear when the pupil begins a new study, for instance, physical geography" (15, p. 147).

Similarly, one can assume that many of the primitive features of language behavior which are displayed in our test requiring an abstract symbolic attitude may not be apparent with our subjects in concrete life situations; however, with much younger children, these features may be conspicuous even under natural conditions.

B. Analogous Functioning

The principle of analogous functioning states that a task can be achieved by genetically different, "analogous," processes (27). For instance, the task of ordering blocks on the Vigotsky test may be mainly attained either through perceptual organization, or through verbal-abstract conceptualization (10). Piaget (17, p. 107) found that a child of seven is able to tell accurately whether an object is to the left or to the right of another one; however, if three objects are involved their spatial relations to one another will not be correctly analyzed until the child has reached the eleven-year age level. The amazing difference in the difficulty of the task is likely to be due to the fact that, in the first test, the child solves the problem by identifying egocentrically the two objects with the two sides of his own body, whereas, in the second test, some apprehension of spatial relationship in an objective sense seems necessary. Thus, the first task might be achieved either egocentrically and empathetically, or abstractly and objectively. Whether lower or higher functions are involved cannot be directly inferred from the correct solution.

The principle of analogous function has an important bearing on the genetic analysis of language behavior. Though an adult may solve a certain language test by assuming an abstract symbolic attitude, a child, by symbolizing concretely, may sometimes be just as successful. If our test had been given in terms of single sentences only, instead of a series of six, our subjects might possibly have performed quite well on a concrete rather than on an abstract level of symbolization. For instance,

a subject presented with the second sentence of series II, may offer the solution: MRS. SMITH WANTED TO "feed" HER FAMILY. The child might arrive at this solution egocentrically, by identifying Mrs. Smith with his mother, etc. Still, he performs the task of completion meaningfully. To turn to another instance, children, in contrast to adults, may translate from a foreign language into their own on a concrete-symbolic level by an empathetic and egocentric interpretation of the linguistic content. Situations of this sort are often not discriminative enough to decide whether a concrete or abstract symbolic attitude is involved. The W-C test appears to be sufficiently sensitive to the difference in symbolism. Sooner or later, a child adhering to a concrete attitude is bound to convey it by his verbal reactions.

Similar conclusions concerning analogous functions can be drawn with respect to signification proper. For instance, our younger subjects frequently evidenced strong embeddedness of the word in a sentence which made it difficult for them to present an adequate over-all solution. Whether these same subjects are able to grasp the meaning of a word independent of its concrete sentential context in everyday speech can hardly be inferred from the fact that they seem to use the same word for two different contexts. Traditional verbal communication does not necessarily entail the usage of words as discrete lexical units. A minimum requirement for correct application of a word such as "dog" is to place the contextual meaning of dog 1 in sentence 1 and dog 2 in sentence 2. In order to determine whether, in such instances, the meaning of dog is independent of the contexts in which it was placed, in other words, is a truly lexical entity, specially constructed tests such as the W-C test are required.

C. Functional Variability and Stability

This principle is in some way an amendment to the principle of analogous functioning. It states that the stage of maturity characterizing an individual or a group must not be conceived statically, as a fixed pattern of operation; it should rather be understood dynamically, as a potential range of genetically graded functions. Mental growth is definable in terms of reorganization due to the inclusion of new forms of operations. This implies that an individual depending on outer or inner circumstances may operate at genetically differing levels. The principal question which a developmental study such as ours should answer is not simply whether an individual symbolizes concretely or abstractly,

whether he clearly lexicalizes, and so on. It is rather this: Is a child able to operate on a sufficiently high level if presented with a task that requires abstract symbolism? Is the genetically higher level of operation well established? Or is it stabilized insufficiently, so that certain circumstances which do not affect the more mature individual may force him to a lower level of functioning? In brief, the genetic level of an organism will have to be defined in terms of its stability. Susceptibility to retrogression, in amount and depth, will have to be measured by the response to tasks varying in degree of difficulty.

In view of these three developmental principles, it will be of interest to compare the various immature forms of signification elicited by our test with those which children exhibit spontaneously, during earlier language development.

II. CONVENTIONALIZATION OF SPEECH

A. Word Meaning

The child, growing into an adult culture, becomes slowly aware that verbal symbols are part of an objective system of intercommunication rather than belonging to a private world egocentric in character. Conventionalization or standardization of language is one of the important aspects of the development of intercommunication. We analyzed this development in terms of decrease of variability of solutions. The main reasons for the higher variability of the responses of the younger compared with the older children lie in the relative singularity of the word content as well as in the highly individual private interpretation of the context of the test sentences offered by younger subjects. These two marks of egocentricity of language behavior are found in everyday situations the more frequent the younger the children are. Though, unfortunately, no comprehensive exact study dealing with the content of children's vocabulary has been undertaken, we know from innumerable investigations that many childish words are subjected to the developmental process of conventionalization till their meanings are fairly congruent with the word content of the adults. In general it is probably true that conventionalization is attained with concrete words first and with abstract words later. Long after the child has abandoned the use of words of his own making he will attach his private meaning to adult words of less concrete reference. To illustrate, for a 33-months-old child "chimney" meant: "It's for tanta tlaus to do in." For a seven-year-old girl, the term "vanity" meant, "a person looking in a mirror" (15, p. 128). A four-year-old boy began to use the word "imagination" in the sense of any undesirable quality in objects. He evidently

thought that to have imagination was not quite proper. He gained this feeling about "imagination" from the way his elders used it in his presence. "He has a lively imagination" had the effect of a mild reproach. Thus, unable to drive a nail in a box, he once exclaimed, "You old thing, you have imagination" (15, p. 138).

Gross deviations from conventional meanings become lessened and corrected in young children mainly by the reactions of elders to singular usages of words. In the growing child conventionalization occurs to an increasing extent also through the child's observance of a discrepancy between his own and other people's word usage. Our results bear witness to the considerable influence of private experience coloring the content of words of children of elementary school ages. The high frequency of singular responses of our youngest children is in agreement with the postulate of spiral development. The relatively abstract situation of the test is to be expected to enhance, in the younger children, primitive, egocentrically determined conceptualization that might be apparent to a much lesser degree in the everyday life situation.

B. Sentence Interpretation

As discussed in previous sections, the process of signification depends, among other things, on the manner of perceiving and interpreting the sentences in which these words stand. Core concepts, for instance, emerge not only because of the holophrastic character of word meanings but also because of the primitive comprehension of the nature of a sentence. The sentence, primitively conceived, is global. not clearly differentiated into linguistic units, an "open," alterable structure. Semantically, its context is not fixed objectively but is shaped in accord with private experience — assimilated to ideas that pass incidentally through the mind of the subject or to the content of other sentences of the same series.

As Karl Groos has shown, the spontaneous narrations of children of nursery school age, as well as the reproductions of stories that were told to them, contain typically many instances of fusion of elements taken from different parts of the story or different stories altogether (28, p. 156). The "regression" to this earlier stage—observed with the younger children in our test—that is, the shaping of a sentence content through assimilation, is pressed forth by the urgency of performing a rather abstract task. A sentence is often well understood as it stands by itself; but under the pressure of finding the meaning of a word that fits several sentences, the sentences may fuse in content and become interpreted as identical.

We are reminded here of the verbal behavior of school children in some of the reasoning tests that, like the "Proverb-and-Idioms test" are of a rather abstract nature. This test, designed by Claparède (5) and later used by Piaget, Watts and others (18, 25), requires the child to match a proverb with one of several idiomatic sayings. A ten-year-old subject of Piaget (18, p. 139) connects the proverb "So often goes the jug to water that in the end it breaks" with the sentence "As we grow older we grow better." The child's reason why these two sentences mean the same thing is the following: "Because the jug is not so hard because it is getting old, because the bigger you grow the better you are and you grow old." Due to the urgency to relate two sentences assimilative tendencies emerge that are based on the core "getting old."

Notwithstanding the valuable insight into signification processes which one gains from the proverb test, one might justly criticize its employment as a developmental reasoning test for young children who do not grasp the meaning of metaphorical sentences. Under these circumstances the test has no correct solution and is therefore of an entirely different nature for younger as compared with older children. This complication is avoided in our test. According to our triangular schema of symbolism (cf. p. 87), a metaphorical language test demands a high type of symbolic behavior.

It is, therefore, expected that children starting to operate at this symbolic level will at first regress to signification processes of greater immaturity than they exhibit under conditions not requiring metaphorical comprehension. It may also be regretted that Piaget did not give a sufficient number of detailed reports nor present any statistical data. Watts (25, p. 214) gave a Proverb-and-Idioms test to older school children, ranging from 11 to 14 years of age. His numerical results indicate that in terms of percentage of correct responses, his test was at about the same level of difficulty for these age groups as ours. However the question as to the amount and nature of immature processes elicited by that test, remains unanswered.

III. LEXICALIZATION

Practically all students of child linguistics have noticed the holophrastic nature of early verbal symbols. As is well known, the first words uttered by the child have the meaning of a sentence. Such verbal patterns have been variably termed "one-word-sentence" (21), "rhema" (3), "holophrasis" (28). For example, when a German child, two-years-old, uses the expression "mid" (with), it stands for a complete wishful thought, namely, "I want to go with you!" (21, p. 315). The one-word-sentence represents an undifferentiated whole, which is extreme semantically as well as structurally. Out of it develop speech forms of word and sentence. The process of lexicalization is part of this development. As the child advances in age, the word becomes, semantically as well as structurally, more and

more self-contained. The young child does not structure the phrase into distinct word units, nor does the word attain for him the circumscribed meaning of conventional language.

A. F. Watts in his book on *Language and Mental Development* makes these comments on the lack of distinction between word and phrase:

> Most words have to be isolated for the infant out of the flow of sounds which all speech at first seems to be. Even at school, young children are still found who have difficulties of this kind about common everyday words. Familiarity with print helps to know words as separate elements of his language. But what he has not seen written he may not so easily analyze for himself. And in transcribing from print he may fail sometimes to observe word-divisions. The present writer has seen little children write such words as "alofersodern" (all of a sudden), "gudafnoon" (good afternoon), "apastate" (half past eight), etc. (25, p. 64).

Gassmann and Schmidt, in an experimental study on errors in sentence reproduction found the following difference between pre-school and school children: "Kindergarten children, much more frequently than school children, tied together adjacent words into one phonetic unit. The pre-school child, though able to apprehend the general meaning of a sentence has no clear understanding of boundaries between single words" (6, p. 229).

Pohlmann (19) who studied extensively the language of the school child has demonstrated that even the school children six to eight-years-old frequently use words holophrastically. For example, a seven-year-old child, asked to explain the phrase "edible fruits," answered "pears." Further inquiry brought out that he was referring not to the particular isolated object "pear" but to a concrete situation: "Yesterday we ate pears and I was thinking about that."

One may assume that the law of spiral development holds for lexicalization as well as for other genetic processes. Lexicalization is not simply dependent on age but also on the level of operation required by the situation at hand. A child may employ words in a precise and relatively delimited sense within a concrete context, but he may fall back to broader holophrastic or vague usage under the conditions of a task that demands higher abstraction, such as a definitions—or concept—formation test. O'Shea remarks: "I have tested children upon many definitions of terms which they could interpret quite effectively as they occurred in the ordinary contextual relations of speech and reading; but they could not satisfy any dictionary maker in their responses" (15, p. 145).

As one will recall, we noted with our youngest groups many instances of a discrepancy between the usage of a word within

a sentence and as a general term removed from the concrete context. After having placed a relatively circumscribed term within various sentences these children regress to a contextual core concept when asked to state the overall meaning of the artificial word (cf. p. 20). The increasing lexicalization is indicated by the fact that such discrepancy in verbal behavior did not occur with the older subjects.

IV. GENERALITY AND SPECIFICITY

One of the principal difficulties which the child encounters in our test consists in finding a concept broad enough to be used for a variety of circumstances and, nevertheless, specific enough to fit each of the various concretely given contexts. The final solution thus has to be a concept that lies between a too general and a too specific meaning. Our younger subjects frequently selected meanings that were either overspecific or overgeneral. Our analysis demonstrated the many ways by which the children attempted to reconcile the specific meanings chosen for a word, with the demand for generality, e.g., pluralization, transposition, holophrastic concretization, etc.

Overinclusive solutions, since they did not involve any especially noteworthy signification processes, were not treated in particular in our analysis. But one should note that, just as there was a decrease in overspecific concepts with age, there was also a decrease of overinclusive word meanings. The following tabulation summarizes the developmental changes of overgeneral (partial or complete) solutions in terms of mean occurrence per child; it shows a considerable drop occurring after the third age level.

Age Group	I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)
Mean	3.24	2.88	3.20	1.36	0.96

The young child's difficulty in formulating a concept of "medium" generality, viz., one that is neither too general nor too specific, showed itself also in regard to shifts toward greater generality or specificity occurring within a test series. For instance, our younger subjects, in order to fit a greater number of sentences, not infrequently shifted from an already formed very specific solution to one that is overgeneral (cf. p. 21). On the other hand, a shift from an overgeneral solution to one of medium specificity was relatively rare in the younger children but became more conspicuous with the older groups. The following tabulation demonstrates the relatively late development of this "specification" process. It increases considerably after the third

level (difference between groups IV and V statistically significant at the .05 level).

Age Group	I (9 yrs.)	II (10 yrs.)	III (11 yrs.)	IV (12 yrs.)	V (13 yrs.)
Mean	0.44	0.52	0.84	1.32	1.92

The difficulty in forming "middle" concepts, the selection of too broad or too narrow solutions, and the shifting between these extremes, have a parallel in early language development. As is well known, infantile names are extremely vague and "general" or very concrete-specific. Ament's observation is probably correct that first names usually are extremely inclusive, such as "mamma" or "babab" employed for all human beings. Very soon "concepts of the opposite character are formed, viz., those of an extremely concrete nature; for instance, *medi* (girl) used for the sister only" (1). Observations reported in literature seem to indicate that during the preconventional stage of language the "universal" meaning of a primordial word is, in general, not gradually changed to a meaning of lesser and lesser inclusiveness; such a word is either abandoned altogether, or it might quite abruptly acquire a specific and concrete connotation. Good illustrations are furnished by Ament's report on his daughter. The child, one-year-old, used "mammamm" for all foods; eight months later, "mammamm" was not used anymore for any type of food. Instead, solid food was called "brodi" (bread), milk named "mimi" and all other drinks "bi" (from "beer"). On the other hand, the word "baba" shows the shift from the vague to the specific. Used previously for female and male persons and their portraits, it became, within a week, the individual name exclusively reserved for a single person, the father. These are representative examples of early changes of naming, demonstrating the predilection of the child for either the vague, general or the very concrete.

Probably the most profound reason why early concept formation lacks that process of gradual differentiation and specification, which is an inherent trait of class conceptualization lies in the inability to form subsumptive relationships. The development of subsumptive generalization involves genetically intermediate steps. These protoprocesses are the subject of the following discussion.

V. PROTOFORMS OF SUBSUMPTIVE GENERALIZATION

Many of the processes analyzed in this study which occur in the course of signification may be viewed with regard to concept formation. A truly general concept is usually symbolized by a

word which applies to a variety of objects called a class. A general concept emerges whenever the two conditions of subordination are met: (1) awareness of a variety of exemplars referred to by a single name; (2) awareness that these exemplars possess common properties. Awareness of identity and difference are both essential for the formation of subordinating concepts.

As mentioned above, the first words of the infant are either highly specific names or vague concepts ("papa," etc.) used for several objects or persons which, though different for the adult, are probably identical for the child. During early speech development, the child, after having formed a name for one object or event, begins to apply it to another perceptually quite different situation. In other words, the child begins to generalize. This early semantic activity presents rich material for the study of primitive processes of generalization and is therefore pertinent to our investigation.

Though on a much higher plane, our test situation is in many ways analogous to the concept forming situation of early childhood. In both cases, the child applies to new contexts a verbal concept with which he is already familiar. Here, on the abstract test level, as there, on a concrete situational level, primitive processes of generalization emerge which are forerunners of truly subsumptive activity. A main difficulty which the younger subjects have with the test is in the selecting of a concept flexible enough to be applied to a variety of contexts. For instance, the over-all meaning of CONTAVISH is "hole" under which is subsumed a "square hole in the wall under construction," an "opening of a bottle," a "road cavity," etc. Under these circumstances, many children, as we have seen, "regress" frequently to a contextual level of conceptualization (core concepts, etc.). Why do young children display so little contextual verbiage in an ordinary concept formation test where a superordinate concept for two or more single objects (e.g., "orange" and "apple"), has to be given? The probable reasons for this discrepancy in behavior lie in the particular relation between the word meaning and the context, demanded by our test: the child is required to lift the word out of the sentence, but at the same time, has to retain the relation to the context from which he draws the cues. In other words, in most instances of everyday life he uses the words either within a verbal context or, as in simple naming, outside of it. In our test he is asked to operate both ways simultaneously. The consequence is that he will often think contextually when he should think lexically. He may not be able to generalize by ab-

stracting the word meaning from a context to which he constantly has to refer during one test series.

In the following are discussed a number of infantile precursors of subsumptive classification that correspond closely to processes found at the higher verbal plane of the W-C test.

A. Classification in Terms of Contextual Belongingness

Many infantile attempts of concept formation that have been recorded by careful observers are based on the holophrastic nature of early names. A primitive type of classification rather than being subsumptive is based on the belongingness of different things to a realistic situation. Darwin, for instance, tells of his grandchild who used the word "quack" to mean duck as well as water. Sully tells of a small child who called his nurse "mambro." This term was later used to include the sewing machine on which the nurse worked, then a hand organ that somehow resembled the sewing machine, and—obviously, in connection with the hand organ—a monkey. Similarly, Egger's son used the word "papa" not only for his father, but for all the objects that belonged to his father (28, p. 226). O'Shea (15, p. 128) cites the range of meaning of the word "dobbin" as denoting all kinds of food, the dining room, the kitchen, the high chair, the closet where milk tablets were kept, and even the motions and sounds made in eating.

As has been pointed out by Werner (28, p. 227) this proto-form of subsumptive classification is only superficially explained in terms of association. The inner connection between things called by the same name is fully intelligible only in terms of the "fundamental principle that primitive classification is rooted in the concrete naturalistic situation." Monkey and hand organ, for instance, can be called by the same word because both are elements representing a global context.

The similarity between these early forms of concept formation and signification processes occurring with our subjects will become clear from an example:

L.P. (11-3) signifies CONTAVISH in these sentences by "room," "switch," "live wire":

sentence 2. THE MORE YOU TAKE OUT OF A "room" THE LARGER IT GETS.

sentence 3. BEFORE THE HOUSE IS FINISHED THE WALLS MUST HAVE "switches."

sentence 4. YOU CANNOT FEEL OR TOUCH A "live wire."

The explanation given by the child starts with "live wire." "It fits the third sentence because switches must have live wire

to work. It fits the second sentence because a room has to have light." We may safely assume that CONTAVISH has as its background reference something like "room furnished with light" (assimilative core concept). This global conception permits the child as he moves from sentence to sentence to select successively, in pars-pro-toto fashion, various elements of this holophrastic context.

B. Classification in Terms of Pluralization

1. *Transitional forms: contextual belongingness and pluralization.* As one will recall, a plural concept binds together various meanings of a word; however, these meanings are so specifically conceived and the over-all concept so vague that it cannot replace those single concepts. Some observations made by child psychologists seem to indicate early attempts of concept formation that represent transitional stages toward pluralization. To illustrate, an 11-month-old boy calls a horse by a gutteral "o - o - o." This sound pattern indicates the effort of the horse pulling a carriage; it is later used to designate a man pulling a cart (21, p. 381). For another child "tam-tam," seemingly a name for "soldier," carries with it a fringe of broad associations connected with military music. It is applied for situations that include a rhythmic noise; therefore, the bath tub is greeted with "tam-tam" because of the splashing noise of the water. One is probably justified to assume that the basis of naming is here not solely the belongingness to a global situation. A common denominator, a "contextual core," as it were, e.g., a rhythmic noise, etc., appears to be present in these cases (21, p. 34).

Analogous instances, though on a higher verbal plane, can be found in our study. We restricted the term "plural concept" to those cases where word meanings were not fused with the meaning of the sentences. However, instances of precursors of pluralization proper occur on the level of sentence-core conceptualization (including assimilation). In other words, the vague over-all concept is here a sentence-core rather than, as in pluralization proper, a circumscribed concept. For example:

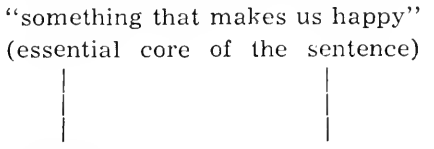
In series XII, ONTRAVE is translated in the first sentence by "parents," in the second by "get."

"Parents" SOMETIMES KEEPS US FROM BEING UNHAPPY.

IF YOU "get" A GOOD MARK YOU MUST ALSO WORK FOR IT.

"Ontrave," the child reasons, "means 'happy' because: parents make us happy—if you get a good mark you are happy."

The relation between the over-all sentential core-concept and the individual solutions may be thus presented:



M.B. obtains an over-all solution for HUDRAY, "smart":

MRS. SMITH WANTED TO "fix" HER FAMILY ("you have to be smart to do that").

JANE HAD TO "sew the material smaller" SO THAT THE DRESS WOULD FIT MARY ("you have to be smart for that too").

Then in sentence 4—"You have to be smart to read and study."

Thus, "to be smart" (sentence-core concept) is pluralized into the individual solutions, "fix," "sew," "read and study."

2. *Pluralization proper,* in contradistinction to the instances cited above, involves over-all concepts that are relatively circumscribed rather than contextual cores.

If a child signifies PRIGNATUS to mean in various sentences "hit back," "holler," "lie" and then states as over-all solution "not respect," he comes as close to the use of a class name as word embeddedness will permit.

William Stern has shown that before the child is capable of forming true (abstract) class names for objects he may employ "plural concepts." "The child already knows" says Stern "that 'horse' is not a unique individuality but something which he may encounter in many different exemplars. . . . He now orders each new specimen so that it stands in conjunction with others previously known, but he does not subordinate all exemplars to a common universal concept." Stern's son, for instance, discovered, at the age of 1-7 years, that the name "door" could be applied to a number of various similar objects. "Pointing to a door he asked 'that'? We said 'a door,' and, as if to assure himself that the same name would always be forthcoming, he ran to a second and third door in the room, repeating his

question. He followed the same procedure with the seven chairs in the room" (22, p. 392).

As these examples suggest, plural concepts of early childhood emerge when the child begins to employ one word for similar things and at the same time treats it as an individual name for each individual object.

According to Stern, the seemingly generic names which the young child uses are in actuality plural concepts. Not before the child enters the fourth year will these common names acquire the nature of truly generic, that is subsumptive concepts (21, p. 195).

Stern's statements obviously refer to concepts acquired in a naming situation, that is, to concepts relatively isolated from linguistic contexts. The child probably will understand the general nature of verbal concepts that are parts of a linguistic context at a much later age than of relatively isolated names. We have to assume that, long after he has indicated an ability to build abstract general concepts he may still use the words as "embedded" in the sentence, in an highly individualistic sense. Unfortunately it will be difficult, if not impossible, to determine the age when the child will, in his everyday speech, lexicalize. When a child uses a word correctly in a sentence, one does not know whether the fitting words are lexical units or whether they are parts individually colored and determined by the particular context.

Whatever obstacles there are in determining lexical growth in everyday speech, we are probably justified to interpret the occurrence of pluralization in our test as an indication of spiral development. A relapse into an earlier stage of plural concepts occurs—when the child is faced with the task of forming a meaning of a word that appears in several contexts.

C. Classification in Terms of Transposition

Another protoform of subsumptive generalization is transposition. Here, as in pluralization, the solutions are so specifically embedded in the various test sentences that they can not be replaced by a common concept. In contrast to the vague overall plural concept, the common concept is a specific solution taken from one sentence to which the other specific solutions are equated. This equation ordinarily is expressed by words such as "like," "sort of," etc.

To recall one of the previously mentioned test examples, a child, after having formed the solution "bar" for one sentence,

"table leg" for another, formed the over-all meaning by transposition: "a table leg is sort of a bar."

Proto-classconcepts of this kind are very close forerunners of subsumptive class concepts. They are concrete modes of generalization such as are frequently used in everyday language. People may speak of pot-like hats by which they do not mean that hats are subsumed under the class of pots but that the impression made by such hats is approximately equivalent to that made by a pot (28, p. 245).

The unconventional conceptual generalization of preschool children probably occurs to a great extent through transposition. Most of the quasi-metaphorical expressions, mentioned by child linguists, very likely are the result of transposition. Stern's child (3-8), for instance, while observing her mother tapping with her fingers on the table, asked: "Why do you 'piano' (Klavierst) there?" (21, p. 408). "To play the piano (Klavier)" appears to be not a subsuming concept, but a concrete notion transposed to name a somewhat similar event.

Transposition in early childhood, as well as in our test with older children, occurs as a consequence of highly individualized, concrete meanings of words. This high individuality of word meaning is a genuine characteristic of the language of very young children, but children of elementary school age, as tests have shown, outgrow rapidly that immature stage of naming. Eight- to nine-year-old children are quite capable of defining concepts by means of subsumptive generalization. The "relapse" of our younger subjects into highly individualized concepts is a function of the test: a child, while capable of generalizing on an abstract level when dealing with self-contained names, may still comprehend a word in a specifically concrete sense when it is part of a sentence.

D. Classification in terms of Holophrastic Concretization

A number of our subjects employed certain forms of subsumptive generalization which, though holophrastic, did entail neither word-sentence fusion nor embeddedness. Most noteworthy among these are: synecdochic signification, holophrastic concretization, signification by juxtaposition and by chain.

Very similar processes of concept formation are observable in the spontaneous infantile attempts of naming concrete objects. Of these holophrastic forms the one most frequently employed by the child is probably holophrastic concretization. In

holophrastic concretization, as one will recall, the meaning of the over-all concept is applied to various sentences by the addition of varying, concretely qualifying elements. Thus, in contradistinction to pluralization, the common denominator is verbally expressed. To illustrate: one of our subjects used "yell hurray" in one sentence, "yell happy birthday" in another. Another child employed "collect ribbons" in one sentence, "collect autographs" in another, etc.

Holophrastic concretization brings to mind the way very young children are known to form class names by concrete composition. Stumpf's son, who talked in a language of his own until he was four years old, used, for instance, the following composite words of the class *man*: "look-man" (spectator), "pap-man" (eater), "bich (letter) -man" (mailman), "book-man" (reader), "Koko (chocolate) -man" (grocer), etc. (23). Lindner's daughter, four years old, designated the various pains by composite names that included the objective causes of injuries. She spoke of "glass-sore," "knife-sore," "dog-sore," "cat-sore," "stove-sore," etc. (13).

In such cases of concrete classifications, the child maintains the specific character of each name, but links it, through a verbally expressed common denominator, with other equally specific names.[3]

In sum, holophrastic forms of conceptualization found in early child development are clearly of a similar nature as those found in our test situation. However, by stressing the similarity one should not be oblivious of the fact that these protoprocesses of subsumptive generalization occur in both instances at very different levels of operation. In the case of early speech, signification of words is achieved through names that refer to objects as parts of global concrete situations. In our test, the words to be signified are parts of varying verbal contexts. Our younger subjects, by carrying out the task of signification on the verbal-contextual plane regress to the usage of fluid, holophrastic connotations long abandoned in their ordinary speech habits. When the test word is grasped as referring to a global, fluid situation, with elements capable of representing the totality, the child may easily—though immaturely—fulfill the otherwise difficult request for placing the same word into different sentences.

[3]As is well known, classification by concrete composition is a primordial semantic device of many, if not all, languages. It is particularly evident in the classificatory grammar of primitive languages such as Bantu (28, p. 229).

VI. CONCRETE SYMBOLISM

Generally, between the ages of nine months and one and a half years the child crosses the threshold of human speech. He comes to understand that sound patterns are not merely *signs* directing behavior but are *symbols* representing objects or events. Though the crossing-over of the speech threshold probably is the most significant advance in intellectual growth, the child must still progress through several stages of symbolic behavior before he reaches a mature level of "abstract symbolism."

The early language of the child is a language of action, of gesture and emotion—divorced from the context of concrete action and affective situations, words carry little or no meaning for him. At this early stage spontaneously formed words, since they partake of concrete reality, are "natural" symbols. They are vocal gestures that indicate characteristic qualities of things-of-action. For instance, "f-f" is the name which a one and one-half year-old child gave to a candle, a lamp, a match, etc. It originated in the blowing out of matches (21, p. 88). The child's peculiar understanding of names, as fused physically with the things they denote *(word realism)*, is obviously a consequence of this gestural, "physiognomic" speech (28, p. 256).

On the W-C test concrete word symbolism is reflected in the tendency of the younger subjects to determine the meaning of an artificial word by the sound pattern rather than by the context: homophonic word symbolism. We included in the category of homophonic word symbolism sound patterns within a sentence which have no definite referent (neologic naming). Such verbiage seems related to the young child's prattling and his neologic sound patterns of indefinite meaning (21, p. 387).

The interpretation of unfamiliar words in terms of homophonic relationships has been previously observed by experimenters such as Barnes. This author asked 1500 children, 7 to 14 years of age, for the meaning of "armor." The erroneous definitions frequently stemmed from phonic analogy: armor is "to hold a thing by your arm"; "is a river" (Amur); "an anchor," etc. (15, p. 150).

The tendency of the young child to relate words in terms of sound patterns rather than traditional synonymity has been confirmed through conditioning experiments. Riess established, in 7- to 15-year-old children, a conditioned (electrodermal) response to certain printed words by reinforcement with a buzzer. In a subsequent test, the amount of transfer of the electrodermal response from the conditioned word to a homophone, an antonym

and a synonym were determined (e.g., conditioned word: father; homophone: farther; antonym: mother; synonym: dad). In the youngest 7- to 9-year group, the transfer was greatest from the original stimulus word to the homophone. With the 10- to 12-year group, the homophone dropped to second place, the antonym receiving the greatest amount of transferred relationship. The oldest group, 13½ to 15 years of age, evidenced greatest transfer to the synonym, the homophone dropping to third place. Our results showing a significant decrease of homophonic word symbolism from age group I to III agree rather well with Riess' results, indicating that, between his first age group (7-0 to 8-9) and second age group (10-8 to 11-8), transfer of electrodermic response shifts from a homphonic to a semantic relationship of a higher order (20).

Levels of symbolization are discernible further with regard to phrases and sentences. Speech at its earliest level is concrete, and ego-centered. A young child who understands when talked to may not grasp the meaning of simple conversation in which he himself is not involved. The ability to talk of objects remote in space and time also is a later achievement. Even more advanced is the grasp of the hypothetical or perhaps fictitious character of statements presented to the child in the form of test sentences. Often such a lack of abstract symbolism might become apparent only when the statement of the test sentence is at variance with the private experience of the child. For instance, a six-year-old child objected to answering the question: "If your brother is a year older than you, how old is he then?" since, as he protested, he had no brother. It is well known that mentally retarded persons, when tested frequently show a lack of hypothetical attitude. For example, an adult subject with a mental age of seven years, tested for his proficiency in number operations, responded as follows: ("Suppose you give your horse six ears of corn . . . .") "We don't give him six ears of corn!" ("Well, let's imagine that you do . . . .") "No, I can't because we don't give him six ears!" (28, p. 313).

It has been repeatedly stated by genetic psychologists as well as by psychopathologists (28, 8, 11) that levels of symbolism are not specifically restricted to speech; they relate to a far more general cognitive behavior of which speech is only one area. Perceptual organization in space and time, imaginative processes, etc. — not necessarily verbal — reflect levels of symbolization. Space, for instance, develops from a concrete space-of-action to one that is impersonal, removed from concrete life, schematic.

Mentally immature subjects presented with an abstract test of space orientation such as the Porteus maze test, may have to transform the problem into a highly concrete task in order to succeed. This is well illustrated in one of Goddard's feebleminded subjects. He reacts to a maze situation as follows: "Oh, I see, it's a train. S. . . stands for station, don't it? . . . . I'll take Ethel home to Washington. [Looks for opening at finish] Here it is. Write Washington there, please. Here we go. . . . too-oo-t . . . . ps-e-e-e . . . . choo-choo . . . . choo-choo-choo! Here we are. Ethel got home without getting hurt. Washington! All change cars!" (28, p. 177).

Though it is true that immature concrete symbolism is characteristic of our younger subjects, rarely occurring with the older children, one should not be misled by the notion that the symbolic behavior of a particular subject is either concrete throughout a test, or abstract. As emphasized in the beginning of this section the level of operation is not a simple function of the maturational status but depends, among other things, on the task at hand. Thus, with an individual member of our younger age groups variability of the level of symbolic behavior is the rule. According to the nature of the test sentence or the test series, its content, the kind of abstraction demanded, etc., the child may be able to operate on a sufficiently high symbolic level, or he may slide into an inadequate concrete symbolic attitude. For example, the symbolizing activity may be adequate if the sentence, including an artificial word, is presented in form of a simple statement. Immaturity of symbolic attitude may become apparent, however, if the object referred to in the sentence must be viewed as possessing a range of possible qualities. One of the sentences that most frequently brought to the fore an immature concrete symbolic attitude was I,3: A CORPLUM MAY BE LONG OR SHORT, THICK OR THIN, STRONG OR WEAK. A child may see that a long stick is meant in one situation, a short one in another; but in order to conceive of the concept referring to an object having potentially many sizes he needs to advance to a cognitive level at which qualities excluding each other in the concrete (short or long) can be conceived to exist in logical simultaneity.

As mentioned above, the regressive trend toward concrete symbolism appears particularly forceful if the sentence content is at variance with the child's experience. Such discrepancy quickly evokes normative evaluations of the sentence, that is, corrections and protests in terms of morality, desirability, utility (cf. p. 65). Again, younger subjects tended to fall back into an immature concrete symbolism when the sentence content touched upon personal, emotional experience. A sentence content such

as "giving a party" (X,1), "raising a family" (II,2), "doing homework" (IV,3), etc., is apt to incite egocentric associations which might preclude the understanding of the sentence as an abstract or impersonal statement. This fact is well illustrated by the examples presented in section I (cf. p. 64).

The relapse into genetically lower levels of symbolic behavior as a consequence of emotional associations touched off by the content has been clearly seen by Watts. In presenting the results from his Proverbs-and Idioms-Matching test he remarks:

> The weaker children were apt to go wrong when a proverb called out a strong interest or emotion. For example, in interpreting "Necessity is the mother of invention," a great many girls were misled into matching it with "Necessity is like a mother, fond of looking after invention, her child," owing it no doubt to their mothering interest having been aroused. On the other hand, those boys with a strong cupboard love were misled into matching it with "What a child needs it usually asks its mother for" (25, p. 215).

Thus, as a consequence of the emotional content of the sentence, the abstract-symbolic attitude toward a metaphorical formulation has become displaced by egocentric reactions.

In conclusion, the discussion has brought forth the necessity of defining a genetic level in dynamic rather than static terms, taking into account its stability. The degree of stability of a functional level might best be determined by the strength in upholding an activity under conditions more or less conducive to regression. Such dynamic characterization of genetic levels must be included in evaluating developmental stages of signification. This view is of particular importance with respect to symbolic development—not only because abstract symbolism is a prerequisite of verbal test solving behavior but also because abstract and concrete symbolic behavior necessarily coexist even in mature adults. A high degree of stability of abstract symbolization on a verbal test such as ours is thus an indicator that the child has learned to differentiate between areas where a relatively concrete symbolism is quite in order, and areas where a hypothetical attitude is required for adequate performance.

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