

Pačesová, Jaroslava

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JAROSLAVA PAČESOVÁ

**SEMANTIC DEVELOPMENT:  
THEORY AND APPLICATION**

In view of the importance of meaning in the study of language, it may seem paradoxical that semantic development in children has perceived far less attention than either phonology or grammar. But it should not be surprising when we realize the difficulties inherent in making any study of meaning at all. With phonology and grammar, there are tangible features of language form to look out for. Meaning, on the other hand, arises from the way in which forms are used in relation to the extralinguistic world of objects, ideas and experiences. With young children, there is additional complexity: one cannot ask them directly what a word means. Only careful studies of tape- and video-recordings are likely to establish patterns of semantic function and development. The last few years have seen a rising interest in these questions and various theories on the acquisition of word-meaning have begun to come into focus. In our study some of these theories are investigated through the analysis of spontaneous speech data from Czech speaking children. The issues to be discussed here are 1. The kinds of cues children use as bases for extending words to novel referents, and 2. The structure of children's word-concepts.

As for bases for extending words to novel referents, Clark's and Nelson's hypotheses are perhaps most frequently quoted. Despite certain differences in their respective conception of early word-meaning, the notion of underlying components is central to the models proposed.

According to Clark's "*Semantic Feature Hypothesis*" (1973) the initial representation of a word is viewed as incomplete, and as including only a subset of the semantic components that are associated with the same word in adult usage. Since the initial definition of a new word is incomplete, the child makes many referential errors in using it. The number of criterial features in the child's definition of a word increases, until its meaning is complete, or, in other words, conventional. The extensions of words to novel objects are — in Clark's opinion — based primarily on perceptual similarity. That is, objects that are referred to by the same word are perceptually similar in some way, particularly with regard to shape, size, movement or sound.

Nelson (1974) provides a critique of Clark's hypothesis and suggests another, viz. "*Functional Core Hypothesis*". In it the process of learning the

meaning of words is viewed as inseparable from the establishment of early concepts. Citing Piagetian theory in support she contends that children initially lack the ability to analyze objects into perceptual components like "round" or "four-legged" and to use these components in isolation as a basis for classification. She argues instead that children at first experience objects as unanalyzed wholes and classify them in terms of the actions associated with them and the relationships into which they enter. They regard objects as similar if they are functionally similar, e.g., if they are acted upon or act spontaneously in a similar way. In other words, in the Functional Core Construct, objects are organized hierarchically with one object which is the functional core of that category located at the top. Thus, in this model, the meaning of a new word is initially represented by a set of stable functional components and it is assumed that the child will apply new word to referents which have common functional properties, e. g. the word "ball" may be used for a set of various objects that *can be rolled, are bounced* etc.

In summary, the theories of Clark and Nelson make divergent predictions about how children initially use words for objects. Clark's theory predicts that a given word will be used for objects that are perceptually similar regardless of the function, while Nelson's theory predicts that the word will be used to refer to objects that either function in the same way, regardless of perceptual properties, or that the child predicts would function in the same way on the basis of similar perceptual properties. An underlying assumption in both these models of word meaning is that children extend words to a number of referents only if the referents share at least one perceptual or functional feature with each other. Unlike Clark, Nelson views the perceptual characteristics of objects as playing a secondary rather than a primary role in the way children form concepts. Perception is secondary because it is used not as the basis for classification but simply to identify an object as a probable instance of a concept, even when the object is experienced from the relationships and actions that are concept-defining. Both the perceptual and functional accounts agree on the salience of spontaneous motion as a basis for classifying animate creatures, vehicles etc. Thus the conflict is primarily over the relative importance of static perceptual features like shape.

Previously reported naturalistic data on children's spontaneous use of words for novel objects offer little support for Nelson's theory. E. g., some of the overextensions in the diary studies that Clark drew from in formulating her perception based theory are clearly incompatible with a theory that stresses the prepotence of shared function.

Our data—and here we are in agreement with the findings of Bowerman (1978)—also provide evidence against the theory that functional similarity predominates over perceptual similarity in the child's classification of the objects to which his early words refer. There are very few examples of overextensions of words to new objects purely on the basis of similar function in the absence of shared perceptual features, cf. "tololó" designating *the rolling of any spherical object and the rotating of the gramophone record*. In contrast, there are scores of examples of overextensions based on perceptual similarity, especially *shape and colour*, in the absence of functional similarity and many of these occurred during the early period of word acquisition; such data would not be incompatible with Nelson's theory if the instances of overex-

tension based on perceptual cues could be interpreted in accordance with Nelson's proposal that perceptual cues are used primarily to predict the function of an object so that the object can be identified as a member of a known function-based category. However, this interpretation is not possible in many instances. Rather, children often disregard functional differences, that is gross disparities in the way objects act or can be acted upon that are well-known to them in the interest of classifying purely on the basis of perceptual similarities. E. g. one of our subjects used the word "snow" for *real snow*, for *whipped cream on the dish*, for *soapy foam in his bath*, for *the foam on the glass of beer* and for *white clouds in the sky*. These objects all have *white colour* and perhaps also *softness* and *shape* in common with real snow, the child's actions upon them, nevertheless, were completely dissimilar.

A second factor that counts against the function-based theory of how children form object concepts and attach words to them is illustrated by the following observation: Nelson proposes, as a logical corollary of her theory, that 'when instances of the child's first concepts come to be named, it would be expected that they would be named only in the context of one of the definitionally specified actions and relationships' (1974, 280). In other words 'the name of an object will not be used independently of these concept-defining relations at this point; early object word use would be expected to be restricted to a definable set of relations for each concept' (1974, 280). According to Nelson, this hypothesis describes what is usually termed the holophrastic stage. Our observation of early object-naming behaviour of our subjects—and the same holds good with Bowerman's children—does not accord with this prediction. Most of their first object words, cf. "doggie", "cow", "puppet", "sun" etc. were initially uttered not when children were acting upon the objects in question, or for animate objects, watching them act, but when the object were static, in pictures or seen from a distance. This fact suggests that the role of function in the child's early formulation and naming of concepts is less crucial than Nelson believes. Moreover, words for non-object concepts such as "more", "gone", "up" and the like are also components of early child's wordstock. How are these words acquired and extended to novel referents? Something other than functional and/or perceptual similarity must be involved, since the objects as well as activities in the contexts in which children say these words are extremely varied. For many such words, the governing concept of cross-situational invariance involves a certain kind of relationship between two objects or events or between two states of the same object or event across time. Despite Nelson's emphasis on the importance of relational, functional concepts, her theory does not explain how words for actions and relationships are acquired. This is because in her theory actions and relationships are the givens by which objects are classified; there is no account of how these concepts themselves are formed, nor is it explicitly recognized that they, no less than object concepts, in fact are categories summing across non-identical situations. (For details, cf. M. Bowerman, 1976b, 124). Words that reflect the child's recognition of constancies across his own subjective experience or reactions to diverse events are particularly resistant to interpretation in terms of similarities among perceptual attributes or functional relationships, cf. e.g. the use of the word "bác" where the recurrent element in its use seems to be any kind of noise, be it the result of a fallen object, whether broken or not, extended

to describe the move downwards with no accompanying noise, e.g. falling leaf of paper on the one hand, and to the noise in general, such as the thunder.

To conclude, the implications of the various arguments presented above on the nature of children's bases for classifying are that an adequate theory of the acquisition of word meaning has to be flexible enough to account for the child's ability, even from a very early age, to classify experiences on the basis of many different kinds of similarities. Theories built around only one basic class of similarities, whether perceptual or functional, are too restricted to account for the rich diversity of ways in which the child can recognize constances from one situation to the next.

As for the structure of children's word-concepts, recent theorizing has been predicated on the assumption that the child identifies words with one or more stable elements of meaning. In other words, it is assumed that all the referents to which the child extends a particular word share one or more features whether these features are perceptual or functional, and that the meaning of the word can be described in terms of these features. E.g. all referents for a child's word "doggie" might share the perceptual feature "four-legged", all referents for the word "ball" might share the functional feature "can be rolled/bounced". This recent emphasis on words for which all referents are characterized by one or more common features contrasts with earlier accounts of the acquisition of word meaning. Theorists like Werner (1948), Vygotsky (1962) and Brown (1965) emphasized that children do not consistently associate a word with a single contextual feature or set of features; rather they use words complexively, shifting from one feature to another in successive uses of the word. Bloom (1973) has suggested that both kinds of word usage may occur in early development, but not typically at the same time. She argues that the association of words with consistent features requires a firm grasp of the concept of object permanence. Complexive usage reflects lack of that concept and occurs early in one-word stage, while consistent usage does not occur until the concept is fully established during the second half of the second year.

Bowerman's data, however, do not support Vygotsky's claim that 'complex formations make up the entire first chapter of the developmental history of children's words' (1962, 70), nor are they consonant with Bloom's more qualified stage hypothesis. On the contrary, both her subjects used some words for both object and non-object referents in a consistent, *noncomplexive* way virtually from the start of the one word stage. In addition, they used other words *complexively*, but this kind of usage was not confined to the earliest period. Rather, it tended to flower a few months after the production of single word utterances had begun and continued on well into the third year, and, for certain words, even beyond. Moreover, the children's complexive use of words was somewhat more common for words referring to actions than for those referring to objects, which does not accord well with Bloom's view that complexive usage results from lack of firm mental representations of objects. In short, the complexive and the non-complexive uses of words were not temporally ordered stages; rather, the two types of word use were contemporaneous. (For details, cf. her 1978 study, p. 271).

In our fata—in accordance with the findings of Bowerman—the complexive

use of words the central referent for a word (i.e., in Bowerman's terminology *the prototype*) was, with a few exceptions, the first referent for which the word was used. In addition, it was the referent in connection with which the word had been exclusively or most frequently modelled. Other referents appear to have been regarded as similar to the prototype by virtue of having one or some combination of the attributes that, in the child's eyes, characterizes it as the following example illustrates: "haf" — prototype — an animal which may bark sometimes; features: having four legs, having fur, having the medium size contrary to e.g. prototype "bú" which was the representative label for big animals, such as cows, horses, elephants etc.

Instances of complexive word usage similar to those discussed here have been remarked on by other investigators as well. Thus Bowerman (1978, 273) has the label "night night" as prototype for a person or doll lying in bed or crib, the features being the crib, the blanket, the non-normative horizontal position of object, both animate and inanimate. The Labovs (1974) have the following observation: their daughter identified the word "cat" with a set of features, all of which characterize ordinary cats. She overextended the word to other animals that possess one or some of these features, but seemed more confident when many of the features were present. Clark notes similar examples, too, and that's why she modified her original theory of children's overextensions to account for this kind of usage by postulating that some overextensions are "partial" rather than "full", i.e., they are based on only a subset of the features that the child associates with the word (cf. her 1975 study); To sum up, the data presented here indicate that 1) children are capable of using words non-complexively from the start of word acquisition; 2) many children's complexive word usages, rather than conforming to the traditional notion of an unstructured chain of constantly shifting meanings, in fact reflect an internal structure describable in terms of a set of variations around a central instance that may be termed a "prototype".

The "*Prototype Model of Meaning*" as adapted by Bowerman to child language predicts a quite complicated pattern of extension for a new word. In attributes to the child the mental capacity to carry out detailed, systematic analysis of meaning. The child is taken to perform decomposition and novel recombination of semantic features that he has extracted from his underlying representation of the best exemplar. In other words, the model presupposes that children are capable of conducting such analyses of underlying components of meaning from at least somewhere close to the onset of speech.

Dromi (1982, 137) outlines an alternative model of meaning which seems more suitable for representing the underlying meaning of situational words, viz. "*The Word-context Production Strategy*". On the basis of data of her daughter's comprehensible utterances, together with extensive information about their contexts of uses, such as "hupa" pointing to balls, small round objects, when observing objects irregularly located in space, sudden contact between those objects and the floor, shortly before or after jumping, touching the floor, walking down the steps, throwing a ball, falling down she has illustrated that the item is not only extended to several referents that do not share attributes with each other, but it is in many cases impossible to determine from the contexts of use what the meaning of the words was for the child. In some cases, a word might be uttered in a more or less appropriate context, but it was

in no way obvious that the child was referring to some specific action or object (e.g. "hupa" said either to the ball or to the action of jumping).

The question arises as to whether the use of some early words as "coverterms" for entire situations is an idiosyncratic characteristic of one child, or whether they are of general character. Some contexts are remarkably similar to contexts in which e.g. Braumswald's daughter produced her early word "bow-vow" as a multipurpose word referring to the sound of barking, bird chirping, car engine or any noise audible in the house or from outside as well as to the sight of dogs and cars (1978, 520). The unusual extension of "bow-vow" was explained by the author as a "semantic mismatch". The child failed to identify the intended adult referent for the word and subsequently matched the word with separate visual or auditory schemes that were based on his overall experiences with this word in repeated situation contexts. A context for learning a new word is evidently very vague and therefore it may be used in very far fetched situations. Gradually, the child restricts the number of contexts in which he utters the word; eventually, the word is uttered only in the contexts which are acceptable in terms of adult speech.

The extension of a word to various objects and actions which do not share perceptual or functional features is clearly incompatible with the theoretical proposals of Clark and Nelson. One would, however, argue that shifting referential behaviour is in the line with Bowerman's "complexive explanation". She in fact provides a very plausible explanation for the shifting behaviours she noted in words. Yet, Dromi's subject's early uses of situational words were not pure complexive overextensions and therefore the "prototype model" does not provide a satisfactory explanation for his early extensional behaviours. Many of situational words were not used to label a prototypical referent, i.e. a specific object or action. In addition, there is no evidence in Dromi's data that the child associated these words with one referent, i.e. Bowerman's "best exemplar" and only later was extended to other referents. What is interesting is to note that the situational words were always applied to referents connected to the same situational context. "Ham", e.g. was used for food, eating, inserting objects into the mouth, empty dishes, bibs, high chair etc. All these referents comprise the situation of a child being fed. This observation of Dromi—supported by similar data in other children, ours included, suggests that a situational word is associated by the child with the underlying representation of a scene, frame or schema. If this hypothesis is correct, then a situational word is uttered whenever the child encounters any object or action that is identified with the situational context in which the word was learned. Scholars working on different topics that are related to the cognitive organization of information have recently suggested that one of the basic forms of organized knowledge revolves around scriptlike episodes. Fillmore (1978, 8) e.g. argues that the cognitive notion of a frame is closely related to people's linguistic processing abilities, thus: 'particular words of speech formulas or particular grammatical choices are associated in memory with particular frames, in such a way that exposure to the linguistic form in an appropriate context activates in the perceiver's mind the particular frame.' Anglin (1979) writing with specific reference to very young children, also suggests that word meanings are often stored in the form of visual schemas that are not analyzed into components.



From what has been said follows that more research is needed in order to fully understand why some words are learned by the child as cover terms for whole situations while others are not. Cross linguistic comparisons may provide important clues to the question of which contents are likely to be represented schematically by children. Another open question is how their meanings change over time. Finally, it seems worth while to carry out systematic examinations of the contexts in which words are being learned. Such investigations may help us to understand why different words in different children follow different paths to adult meaning.

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## POSTUP V OSVOJOVÁNÍ VÝZNAMU: TEORIE A PRAXE

Autorka se ve své stati zamýšlí nad principy, jimiž se dítě řídí při postupném osvojení významu slov. Zaměřuje se především na řešení dvou otázek: 1. který z významových komponentů slova je pro dítě dominantní a tudíž tvoří základ k pojmenování nové mimojazykové skutečnosti; 2. Jaká je struktura dětských slovních pojmů v raných vývojových stadiích. S cílem pokusit se o odpověď na tyto otázky rekapituluje a kriticky hodnotí následující teorie, jež se zabývají podobnou problematikou, viz E. Clarkové „*Semantic Feature Hypothesis*“, K. Nelsonové „*Functional Core Hypothesis*“, M. Bowermanové „*Prototype Model of Meaning*“ a E. Dromiové „*Word-Context Production*“.

*Strategy*“. V konfrontaci s výsledky získanými longitudinálním výzkumem v této oblasti dospívá k názoru, že žádná z uvedených teorií nevysvětluje přesvědčivé počínání dítěte při tvoření slov a jejich praktickém využívání v dorozumívacím procesu. Jako nejméně vhodnou považuje hypotézu K. Nelsonové, jež přisuzuje primárnost složce funkční; tento předpoklad pak, podle Nelsonové, vede dítě k tomu, že označí stejným výrazem předměty, jež plní stejné, případně podobné funkce. Doklady podporující tuto teorii se sice u různých dětí objevují, jejich výskyt je však velmi nízký, např. ve srovnání s pojmenováními, jež jsou motivována shodnými, resp. podobnými vlastnostmi, jež dítě vnímá prostřednictvím svých smyslů (tj. percepční teorie E. Clarkové). Přes poměrně značnou frekvenci dětských slov tvořených na základě shodných vlastností nevysvětluje ani tento způsob zdaleka všechny existující struktury v dětské slovní zásobě. Teorie Bowermanové a Dromiové jsou přijatelnější v tom smyslu, že připouštějí výběr z obou možností, předpokládají však na straně jedné u dítěte takové schopnosti, jako jsou např. dekompozice a rekompozice sémantických rysů, komplexní nazírání na slovní pojem a zároveň schopnost analýzy podpovrchových komponentů významu, tedy schopnosti, jež u dětí v raných stádiích mluvního vývoje přesvědčivě prokázat nelze; na druhé straně pak žádná z těchto teorií nebere v úvahu tak závažné skutečnosti jako je např. individualita dítěte při volbě a kombinabilitě dominantních rysů, rozdílnost přístupu k formě a funkci slova na různém stupni jazykového vývoje, v neposlední řadě pak vliv prostředí, jež dítě obklopuje a nepochybně usměrňuje vývoj komunikační kompetence — od prvních primitivních projevů v celé jejich významové mnohoznačnosti i vágnosti — k definitivnímu zvládnutí náležitých extenzí významu toho kterého slova v daném kontextu i jeho ohraničení v souladu s konvencí v jazyce dospělých.