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## PROCESSING STRATEGIES IN LANGUAGE ACQUISITION

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In the present study we concentrate on the emergence of conceptual categories in children and the subsequent mastering of the words for talking about these categories. Though there are many gaps in our knowledge about how and when different kinds of conceptual categories become established, it seems clear, on the basis of evidence coming from long-time research on language development in children acquiring Czech as their first language, that they — at about the age of two — already have certain categories of objects and situations to which they can attach words. (For details, cf. *Eve V. Clark*, 1983 790 ff.). Their hypotheses about what categories words pick out, however, rarely coincide — at this stage of language development — with adult meanings. This is because children, as a rule, pick out too large a category, that is, they overextend the adult meaning. Or, conversely, they pick out too small a category, that is, they underextend the adult meaning. They may also set the boundaries wrongly, that is, overlap occurs when their use of a word overlaps partially with two or more adult words. And, finally, children may pick out an incorrect category, that is, they mismatch the conventional meaning of the word. In what follows, the four kinds of relations between child and adult meaning, — namely, overextension, underextension, overlap and mismatch — are documented.

*Overextensions* are widely reported in diary studies (see *Anglin*, 1977, *E. V. Clark*, 1973, *L. Rescorla*, 1980). Their basic function is, no doubt, the communicative one. The child is eager to arouse the adult's interest and picks out words for various objects and situations. As he, however, lacks specific terms for many of them, he has to be satisfied with a vague reaction. An example of how material can be prominent in the child's attempt at classification in defiance of standard usage is

the nursery form "bow-vow", probably the first and most frequent basis for overextensions. "Bow-vow" is, for a certain period, used in reference to any mammal, alive or in a picture. As soon as, however, the child says "bow-vow", for example in reference to *a fur coat*, the heuristic function of overextension gets the upper hand. The child fails to identify the intended adult referent for the word and subsequently matches the word with separate visual schemes that are based on his overall experience with this word in repeated situational contexts. Overextension here is the consequence of both the poverty of the vocabulary and the child's readiness to recall at least one attribute common to the known and to the as yet unknown reality, for example *the fur of the dog* and that of *the fur coat*. Gradually, the child restricts the number of contexts in which he utters the word; eventually, the word is used only in contexts which are acceptable in terms of adult speech.

The duration of individual instances of overextensions varies. Some are very shortlived, others may persist for several months. The critical factor appears to be the point of acquisition of a more appropriate word for the category in question. Once a child who has been overextending "bow-vow" to all dogs and other mammals acquires the word "dog", he no longer uses "bow-vow" to pick out instances of the category "dog" but only as a word referring to the sound of barking. The newly acquired term "dog" on the other hand, is now extended to refer to other animals similar in appearance, such as *a lioness, tiger or sheep*, and persists in this function as long as the appropriate terms are absent from the child's vocabulary. Additions to the vocabulary and reductions of the child's semantic complexes are two facets of one process. Both are features of the progressive mastering of the standard model.

Overextensions, as summarized in *E. V. Clark (1973)* and reported on subsequently by *Anglin (1977)*, and backed by more recent observations by *Bowerman (1978)*, *Braunwald (1978)* and *Rescorla (1980)*, are most likely to be based on the appearance of the referent object, the resemblance in shape, size, colour, texture, activity or movement of the adult category. In our data extensions based on shape clearly predominate and examples such as the use of "ball" in reference to any *spherical object*, or the use of "dog" in reference to *any four-legged mammal* may be found in any child. The dominance of size is manifested in the use of "elephant" in reference to any *big animal*, such as *a giraffe, bull or rhinoceros*. The feature of colour, perhaps in combination with texture, is responsible for the use of "snow" in reference to *snow-drift, foam in the bath, the head in a glass of beer, whipped cream in a dish, white clouds in the sky*. Typical of the earliest stage are terms that appear to pick out activities, such as "bow-vow" in reference to *dog-like animals*, "moo" in reference to *cow-like animals*, "hoo" in reference to *any noisy machine*, or movements, such as "shsh" in reference to *any moving machine*, "frr" in reference to *any flying ob-*

ject which has been thrown or is moving in the air, be it a bird, a ball, an arrow, a kite, a rocket, or a sheet of paper, and, on the contrary, the use of "*kutululoo*" in reference to *any spherical object* which is *rolling* on the ground, be it a ball, a marble, or an apple.

The dominance of the feature may, however, vary: *the moon* is referred to as a "roll" or as a "ball" according to its momentary shape; in one case *the horse* in a picture book is referred to as a "horse" unlike the real horse which the child happens to see in the village and for which evidently because of what seems to him its enormous size, he pick out the term "*elephant*". (A similar example may be found in *Els Oksaar*, 1977, 184).

The typical age range in which overextensions in Czech-speaking children appear most frequently is between 1 and 2<sup>1</sup>/<sub>2</sub>, that is roughly the same age range which has been documented in diaries of children acquiring different languages (cf. e. g. *E. V. Clark*, 1983, 803). Also the process of overextending a word is strikingly similar regardless of the language being acquired. For instance the term for "ball" is overextended to pick out *any spherical object*, *one animal term* is overextended to pick out *any four-legged mammal*, *one bird term* then to pick out *any feathered vertebrate*. This suggests that overextensions themselves may offer indirect clues to the conceptual representations children have of certain categories. They seem to judge on the basis of similarities with neighbouring categories whether a word can be extended to pick out that further kind of referent as well. (Cf. *H. Francis*, 1975, 26). The ability to make similarity judgements, then, appears crucial not only for the formation of conceptual categories and other cognitive representations but also for decisions about word use.

*Underextensions*, on the other hand, are usually viewed as lexical phenomena that are motivated by different strategies than those underlying overextensions. This notion can trace its roots to the hypothesis that children acquire word meanings by first attending to general perceptual features and then gradually add more specific ones. The existence of underextensions seem to support the alternative view, namely, that children acquire word meanings by first attending to specific features and then gradually adding more general ones. But the fact that the antonyms overextension and underextension are used to describe two different lexical phenomena does not mean that the two phenomena reflect contradictory acquisition strategies.

Compared to overextensions, underextensions in children are generally less frequent. This is no doubt due to the fact that underextensions occur predominantly in the child's comprehension, while in his spontaneous speech they may be overlooked because the child most likely either overextends another word or does not label the object when he does not think a referent should be included in the extension of a word. Nevertheless, instances where the child comprehends and/or uses a word like "*hands*",

"eyes", "ears", "hair", "shoes", "teddybear" for only one particular, mostly his own hands, eyes, ears, hair, shoes, teddybear, are common at early stages of language development and examples such as quoted above may be found e. g. in Bloch (1924), Greenfield (1973), Bloom (1973), Huttenlocher (1974) etc. We may say that the child underextends the above-mentioned words because he does not use them on other occasions where they would be equally appropriate. On the other hand we have to admit that the child simply may lack interest on these other occasions.

Our ability to detect underextensions is much more limited than our ability to notice overextensions. Unless the child himself comments on the semantic situation, we hardly know about the relation he has concerning the meaning and the word which he uses to express it. Let us look at some examples: On hearing the sentence "*We must shift the hands on the watch, in is not going, it has stopped*", the child is confronted with linguistic usage that runs counter to the knowledge he has acquired so far; *the hands* are not only parts of human arms used for grasping and holding but also the rotating pointers used as indexes on the face of a watch; and, what's more, these hands can *go* or *stand* still, that is produce an action which has so far for him been associated with *the legs*. Hence his protest: "*The watch has no hands, the child has, the hands do not go, the legs go*" thus illustrating that the word "*hands*" is underextended by him. Sooner or later, however, he accepts the information that not only the child but also watch has hands and their rotating movement on the face of the watch picks out the same word as the movement of legs. He still rejects the adult's statement that the watch goes or stands still, cf. the following comment: "*The watch does not go, its hands go*". His argument, though certainly nearer to the description of the extra-linguistic reality, is nevertheless, as unconventional, not accepted and the child, sooner or later, gives up.

The next example shows how the child's comment on the newly experienced reality can be surprising and independent of what he has heard before. In the bath, a two-year-old boy by chance touches his rib and asks: "*What is this*"? Getting the answer that it is *a bone*, he is shocked and cries out unhappily: "*Have I eaten it*"? The recollection of the situation in which when he was having fish for lunch, his mother said at the table, "*Be careful of the bones*", is clear. His question, however, offer several pieces of information. First, the underextension of the word "*bones*" to something *not eatable*, related to food such as fish or chicken' second, his ignorance of the fact that he, as a human being, has bones too; and third, his belief that if he has a bone in his body, he must have eaten it, as this is for him the only possible explanation of its getting there.

From the examples quoted it seems clear that the child's underextended word meanings combine attributes which cut across different domains. They do not, however, imply what is usually taken for granted,

that specific features are being processed before general ones. What is specific is the context in which the underextended word is employed or comprehended. The specificity of the context, nevertheless, is determined by the child's combination of the set of core features which define the underextended entity. Viewed from this point, an underextension is not context bound but concept bound.

*Overlaps* then bring evidence that the child's meanings are broader and the boundaries between them are much less definite as compared to adult meanings. Let us illustrate this fact. As long as the child only uses words in the contexts in which he acquired them, his language appears adultlike, cf. *"It is raining"*, *"I am a big boy"*, *"the dog bit the girl"*, *"the needle pricks"*, *"Daddy is whistling"*, *"thank you"*, *"good morning"* etc. Deviations occur when the child's use of a word overlaps with two or more adult words. For example, a child who thinks *"rain"* picks out falling water, has a meaning for rain that overlaps with the adult *"rain"* and *"shower"*, the result of which are his constructions such as: *"Mummy is raining in the bathroom"*, *"I shan't have a cold rain today"*. Instances such as *"the string is not big enough"*, *"the hill is big"*, *"my grandpa died, he was already very big"* illustrate that the child picks out the word *"big"* — besides its correct uses — also to express *length*, *height* and *high age*. In essence, such overlaps involve simultaneous overextension and underextension and may be hard to distinguish from overextensions on the one hand and underextensions on the other. There are instances where the term 'extension of meaning' fits more from the point of view of adult language while in the child's language the term 'lack of limitation of meaning' seems more appropriate. For example, a boy says: *"The hen has bitten my finger"*, showing that the standard restriction of biting to the use of teeth is ignored by him. Instead of saying that the poverty of his vocabulary forced on him the assumption of related meaning connected with this verb, it is better to say that the proper related verb has not yet been learned. This distinction is important. It means that the child, in using the verb *"to bite"* for non-standard purposes, did not perform an extension of meaning, but, on the contrary, failed to grasp the limitation of the standard definition and convention. (For details, see W. F. Leopold, 1971). A similar explanation holds good for child's constructions such as: *"The snow is pricking my fingers"* (in lieu of *"my fingers are numbed with cold"*), *"The wasp has pricked me"* (in lieu of *"the wasp has stung me"*), *"My ear is whistling"* (in lieu of *"my ears are ringing"*), showing that the standard restriction of pricking to the use of sharp instruments and whistling to the use of lips is not respected by the child. In other words, the child's meaning for *"big"* overlaps with the adult *"big"*, *"long"*, *"high"* and *"old"*; the meaning for *"to bite"* with the adult *"to bite"* and *"to peck"*, the meaning for *"to prick"* with the adult *"to prick"*, *"to sting"*, *"to freeze"* and *"to be numbed with cold"*, the mea-

ning for "to whistle" with the adult "to whistle" and "to ring". The next two examples illustrate that a very important part of learning words is learning what the occasions are on which adult say them. This is an aspect of their function and is conceptually separate from their referential meaning. Names of objects may have a clear reference but an obscure function, they may be part of the passive vocabulary and yet not used spontaneously. — A child says "good morning" on meeting people in the street. On the other hand, he does not say "good morning" to a neighbour. Being asked why, he says with a certain surprise: "We know each other, don't we" thus revealing that in his conceptual organization "good morning" serves the purpose of getting acquainted with somebody while the adult function has not yet been recognized. The same child says "thank you" on correct occasions, that is, when getting something. He uses, however, the same term on incorrect occasions, that is, when giving something to somebody. In other words, his meaning for "thank you" overlaps with the adult "thank you", "help yourself" and "don't mention it". This become a usage before he figures out that only the recipient should say "thank you", not the donor.

From what has been said it follows that the same child may successively overextend, underextend and overlap the same word with the adult's uses or overextend it in a different way on different occasions depending on what he needs words for.

By *semantic mismatches* we mean those instances where the child starts out with a wrong hypothesis about the adult convention governing a meaning of a word, a hypothesis so wrong that the child's meaning is quite different from that of an adult. Mismatches no doubt happen in all children. At early stages, they concern for example the words that pick out the designation of the place, time or manner, cf. the use of "upwards" in lieu of „downwards", "tomorrow" in lieu of "yesterday" or "today", "supper" in lieu of "lunch", "quickly" in lieu of "slowly". At later stages, most mismatches concern the words for which, because of their specialized character or abstractness, the child has no motivation. Like underextensions, mismatches are hard to detect. Unless the child is willing to answer our question or to comment on the semantic situation, we may never discover what he thinks of it. Examples follow to illustrate the fact:

Watching the video fairytale 'The Phlegmatic Elephant' several times, a three-year-old-boy made no comment. Once, however, he said: "look, now the baby elephant will be phlegmatic" — at the moment when, in a circus show, it started flying down the tower using its long ears as wings. The most outstanding attribute of the hero, i. e. *its ability to fly*, has determined the meaning of the unknown term. Compared to the adult use, the child mismatched not only the meaning of the word in question but also the object which was qualified by it; it was not the baby elephant

that was *phlegmatic* but his mother, because her baby had been taken away from her.

Observing a helicopter and getting the information that it is guiding the traffic, the boy is puzzled. He has no idea what 'traffic' (in Czech 'doprava') might mean. He knows, on the other hand, the meaning of the homonym 'doprava', that is 'to the right'. Hence his mismatch: "The helicopter guides to the right, the pilot turns the steering wheel".

Though mismatches of this type have not been noted very often, some good examples may be found e. g. in Clark & Clark, (1977, 486) in Bowerman (1976), Bloch (1924), Bloom (1973) and Huttenlocher (1974), to mention at least a few.

On an analysis of four relations of child to adult meanings, namely overextension, underextension, overlap and mismatch, we have tried to show what goes on as children try to work out what word meanings are. It is hoped that this approach may throw some light on the nature of children's early conceptual categories and how they come to relate such categories to the words in their first language.

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## K OTÁZCE OSVOJOVÁNÍ JAZYKA

Autorka se ve svém článku zamýšlí nad otázkou, jakým postupem si dítě osvojuje pojmové kategorie a slovní pojmenování k jejich vyjádření. Na základě analýzy spontánních projevů dvou až tříletých dětí osvojujících si češtinu jako mateřský jazyk dospívá k názoru, že vztah pojem — slovní vyjádření je u dítěte v raných vývojových stadiích v nejednom směru odlišný od úzu v jazyce dospělých. Hlavní rozdíly jsou následující:

1. Dítě použije jediného slovního výrazu k vyjádření pojmů náležejících do různých kategorií (např. slovního výrazu „pes“ k pojmenování psa, ovce, tygra, lvice, tedy zvířat podobného vzhledu a velikosti).
2. Dítě nerespektuje polysémní charakter jazyka; daný slovní výraz si osvojí a používá v jediném významu, např. „ručičky“ jsou v jeho chápání pouze součástí těla, zprvu dokonce jen jeho vlastního, zatímco skutečnost, že i hodinky mají ručičky, prostě odmítá.
3. Dítě dosud neovládá konvenční ohraničení slovního výrazu a používá ho tudíž v kontextu, kde úzus dospělých vyžaduje výrazu specializovaného — např. výraz „kousat“ nejen k vyjádření funkce zubů, ale i k vyjádření jakéhokoliv pocitu bolesti, sr. dětská konstatování jako: „Kousla mně slepice“ (= místo náležitého „klofla“); „Zima mně kouše do prstíčků“ (= místo náležitého „zebou mně ruce“); „Kousla mně včela“ (= místo náležitého „štípla mně včela“).
4. K úplné misinterpretaci vztahu pojem — slovní vyjádření pak dochází tehdy, kdy dítě přisoudí slyšenému jazykovému pojmenování diametrálně odlišný obsah než je tomu v řeči dospělých. K tomuto jevu dochází zejména při interpretaci výrazů synchronicky cizích nebo abstraktních, pro něž dítě nemá vhodnou motivaci a vytvoří si proto vlastní hypotézu o jeho obsahu, zpravidla na základě hypostaze nejmarkantnější vlastnosti subjektu (např. „flegmatický slon“ = „létající slon“ — jako důsledek jeho schopnosti létat prostřednictvím velkých uší).