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ABSTRACT

The present paper reports the analysis of a diary study of a German-speaking child and reveals interrelations between semantic and phonological development: some of the subject's overextensions were explained by a deliberate avoidance of a form and the use of an easily pronounecable substitute rather than by erroneous attempts to map linguistic and non-linguistic knowledge. These results suggest that there may be phonological as well as lexical or conceptual reasons for children to (apparently) overextend the meaning of a word. The findings emphasize the danger of a modular analysis. Different linguistic levels should not be seen individually and independent of one another.

INTRODUCTION

Several studies of the acquisition of word meaning have attempted to interpret children's variations in the extension of lexical items (cf. review in Dromi 1987). The use of words for more than conventionally accepted referents is traditionally called 'overextension'. Analogously, using a word for less than conventionally accepted referents is called 'underextension'. Over- and underextensions are usually explained in terms of not fully developed mapping of linguistic and cognitive systems (Clark 1973, 1993, Nelson 1974, Bowerman 1978, Barrett 1982) and/or incomplete vocabulary (e.g. Barrett 1982, Clark 1983, 1993). The perceptual basis for overextensions was emphasized by Clark (1973, 1983, 1993), whereas Nelson (1973, 1974) concentrated on functional factors. In this paper an analysis of the phonological and

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lexical development of a German-speaking child (cf. Elsen 1991) provides the foundation for a further method of explaining over-extensions. There were specific cases in which the child's phonological system did not allow the production of a term and a semantically related form was substituted.

In the process of acquiring the words of their mother-tongue, children face the problem of how to express more or less developed non-linguistic categories (concepts) using phonologically relative consistent forms referring to more or less similar objects, situations, feelings, etc. Linguistic and cognitive systems interact during development. As an exact description of a young child's concept is not available, especially not during the one-word period, the theoretical extension of a term must be constructed with the help of the objects named and from the situations in which the word is used by the child. It is generally assumed that a child who calls a cat *dog* has not yet fully developed the concept of dogs and therefore creates an overextension. For some overextended words an 'it looks like' or 'it reminds me of' explanation is offered (Leopold 1949). In other cases the attempt to fill a lexical gap (Leopold 1949, Bloom 1973, Barrett 1982, Clark 1983, 1993) is suspected, indicating that the concepts may be well developed and that the children try to express an idea other than the purely referential one when producing a single word. Most instances of overextension by children are interpreted as the result of not yet fully developed concepts. On this account, children overextend words to referents for which adults would use separate terms. These deviant extensions are explained differently by various authors. Clark (1973) states that words in an early stage of development are overextended because only general perceptual features are recognized. Nelson (1974) suggests that only those terms are overextended whose attributes are transferred to functionally related objects. Bowerman (1978) states that early words are mainly learned in connection with one or a few highly similar objects, which become 'prototypical objects'. Barrett (1982) combines prototypical and contrastive aspects in describing the gradual construction of semantic fields in early lexical development. Similarly, Clark (1983, 1993) explains the gradual construction of the lexicon using the 'Principle of Contrast' and the 'Principle of Conventionality', which combine conversational needs of the speaker to express contrasting meanings and of the hearer to be understood by conventional forms. She explicitly stresses the role of communication. Some words are used deliberately for objects whose names are not yet established in the lexicon, thus filling lexical gaps. This kind of over-extension might be called *lexical* as opposed to the earlier-mentioned

semantic one. Dromi (1987) claims that at least some productions of words are bound to situations rather than being referential (cf. Bloom 1973, Bowerman 1978, Clark 1993).

Although all the presented explanations may work successfully in dealing with most overextensions found in child language, there are some examples given in this paper which cannot be treated effectively. The author of this paper proposes that there may be reasons for the use of overextensions other than lexical or semantic.

Phonological reasons for withholding a lexical term have been mentioned by Leopold (1939–1949) and Stern & Stern (1928). For example, Leopold noted his bilingual daughter's attempts at *Zunge,* 'tongue' (Leopold 1939) and *yes*. The latter was given up in favour of the German equivalent *ja*. Leopold postulated phonetic reasons. The child preferred imitating the German *ja*. Her attempts at *yes* would not have been exact because of the final fricative and thus would not have satisfied her (Leopold 1949: 176). Similarly, Stern & Stern recorded that their son Günther did not use *Mutter,* 'mother'. They argued that this word was missing from his vocabulary because the simple form *Mama*, 'mummy', was not employed in the child's family but only the more difficult *Mutter* (Stern & Stern 1928: 88f.). They thus implied articulatory difficulties with this term as the reason for withholding it. More recently, other researchers have described a phenomenon known as the 'Principle of Avoidance' (Drachman 1973, Ferguson & Farwell 1975, Menn 1978, Schwartz, Leonard, Frome Loeb & Swanson 1978, Cruttenden 1979, Menyuk, Menn & Silber 1986, Elsen 1991). The Principle of Avoidance states that words might be deliberately avoided due to articulatory deficits. Children may not use words which contain sounds, sound sequences or syllabic patterns not yet mastered. Together, these suggestions lead to the conclusion that phonological constraints may be an important factor in the explanation of overextension. The purpose of the present analysis is to investigate the validity of such an explanation, based on a large corpus of early production data from a German-speaking child.

METHOD

The following data are from a diary study of A., a first-born girl acquiring German, taken by her linguist mother, the only care-taker and observer-recorder. Notes were taken periodically from birth up to her first word, *nein,* 'no', at 0:8,23. Then data on pronunciation and essential linguistic and non-linguistic situations were collected continuously both day and night. All new items and novel pronunciations of

established items were documented. Notes were transferred to filing cards twice a day with additional comments on situation, frequency of use and changes in articulation when necessary. The entire corpus was cross-checked three times a month. Daily notes ended when A. was 2;5 and had completely acquired the phonological system (cf. Elsen 1991). Due to continuous joint living of mother and child, a complete recording of items and phonological development during this period of time was obtained and the corpus became quite voluminous. Although the study concentrated on phonology, striking facts about situation and referents, as well as comments on frequency and mortality of the individual lexical item, were recorded. Additionally, audio-recordings were taken from the age of 0;4. Some early audiotaped data were verified by sonagrams and a trained phonetician. High agreement rates were reached. Audio-recordings were used for description of the babbling-period and as a control for later development. Prelinguistic progress was described chronologically to show the gradual emergence of speech sounds from babble sounds. Data concerning lexical development were listed alphabetically and chronologically to permit an examination of the lexical system as a whole as well as of individual items (cf. Elsen 1991). For the present investigation, data were re-analysed and both phonological and semantic aspects were considered.

RESULTS AND DISCUSSION

Phonology

At 0;11 A.'s phonological system was not yet well developed. Words with one or two CV-syllables consisting of labial and alveodental nasals and voiced plosives predominated. Fricatives and voiceless plosives were rare. Prior to 1;0 the majority of words produced by the child contained front plosives and nasals. Then the lateral appeared regularly. At the end of 1;0 A. still constructed mainly CVCV forms. Single syllables were more complex: CVC or CVVC. For example, *Bauch*, 'tummy' was generally pronounced [baba], occasionally [bauu], [bauuv]. At the end of 1;1 a special pattern emerged: [d]/[g] – V – (ambisyllabic) velar plosive – syllabic lateral, e.g. in [gak̩l̩], [dag̩l̩] (*danke*, 'thank you'), [dɛk̩l̩] [gɛk̩l̩], [dak̩l̩] (*Deckel*, 'top, cap'), [gak̩l̩] (*Gurke*, 'cucumber'), [dig̩l̩] (*killekille!*, a baby-talk form used when tickling), [dag̩l̩] (*Schachtel*, 'box'), where the dot above a consonant indicates ambisyllabicity. These forms cleared the way to the acquisition of a more or less adult-like ['əl̩] (*Vogel*, 'bird') for birds, at 1;2.28, which replaced early versions for these animals like [pipi(p)], [gagak]. A. did not use VCCV forms. A sequence of consonants was

uttered only sporadically in monosyllables, e.g. *Mund,* 'mouth', mainly [mama], once imitated [manθ] at 1;0,29. In very rare cases a complex two-syllable word was produced repeatedly. e.g. [namnam], a reduplicated form referring to meals (1;1).

Vocabulary

At the beginning of 0;11. A. had an active vocabulary of approximately twenty words, as shown in Table 1. Some of these early words were overextended. Others, like *nein,* 'no', *Maus,* 'mouse', *tööt* (when nudging noses), *Baum,* 'tree', *Tag,* greeting, *Auto,* 'car', and the sound for hares were used regularly. The latter was a kind of sniff, initially an acoustically distinct snuffle, with the air being sniffed in and out repeatedly. Later this was reduced to a short sniff. Although not produced orally, and therefore not accepted as a word, it was used appropriately only for hares and rabbits (real and toy rabbits, pictures of hares and when hearing the word for hare). The child was able to talk about these objects successfully, which meant a rather well-developed ability to map meanings on forms.

As most children, A. was interested in animals. She spoke of mice, teddy bears (and soft toy animals) and hares. [vava] was used for dogs (0;11,3 – 1;2,26, then replaced by ['ʊnt], *Hund,* 'dog'). Initially it was overextended to animated comic figures, people, and animals. It was occasionally used for cats up to 0;11,29, when her word for cats, [mɛn̈ə], probably derived from *miau* 'meow!', appeared. At 0;11,15 A. went for a walk in a nearby park. She spontaneously named birds (small, ability to fly) [pɪpɪ(p)], ducks and geese (bigger, mostly walking and swimming, special kind of noise) [bagbagba], crows (black, special kind of noise) [bɔa] (hoarse voice). At this time, these expressions were used at one semantic level and not as superordinate and subordinate terms (cf. Clark's 1993: 62 'single-level assumption'). All three were instances of onomatopoeic formation. By 0;11,29 A. had actively iden ified and distinguished between mice, hares, cats, dogs, crows, ducks/geese, birds. She could name and point at these animals when seeing them in books and in reality and when hearing about them.

Avoidance

Although being a relatively eloquent talker, A. refused to produce the German term *Hund,* 'dog'. Prior to 0;11 the child had seen many dogs – real and toy dogs and pictures of dogs – and heard about them: *schau mal, da ist ein Hund, ein Hund,* 'look, there's a dog, a dog'. Furthermore, she took interest in dogs as well as in other animals. She

TABLE 1. *A.'s first twenty words*

Sounds	Target	Gloss	Subsequent contexts of use
[nan], [naɪ], [naɪnaɪn], [naɪn]	*nein*	'no'	when touching forbidden things; refusing to obey
[mama]	*Mama*	'mummy'	referring to mother, father, grandmother, a dog, photos of the dog; also to all surrounding objects; for the mother, when hearing her voice, calling her or looking at her photos;
[da]	*da*	'there'	handing over objects, when pointing to specific objects to direct attention; when receiving objects;
[baba]	*Papa*	'daddy'	mainly for father (rarely mother or other people); for f.'s belongings, when calling, asking for him for
[aɪ], [ɑ̃ja]	*ei, eja*	when caressing	cherished objects, in pleasant situations (e.g. meals); when caressing people, animals, fur, often accompanied by touching, caressing; also for the rocking-chair, for swinging motion (swings);
[aɪ]	*Ei*	'egg'	for eggs; egg-shaped objects; unsliced potatoes, tomatoes, *Negerküsse* ('egg-like choc, sweet');
[dəta], [data]	*das da*	'that there'	referring to objects, persons and accompanied by pointing; asking for objects; asking for names;
[bɪdə]	*bitte*	'please, here you are'	asking for objects, often accompanied by pointing; when handing over or receiving objects, as urgent request (e.g. for being picked up);
[pɪpɪp]	*pieppiep/Maus*	'mouse'	for mice in books, when hearing the word (toy or live mice were not available);
[tɛdə], [dada]	*Teddy*	'teddy bear'	for teddy bears, soft toy animals, pictures of teddy bears;
[b], [ba]	*Buch*	'book'	at first not for picture books; for books; also for paper, newspapers, journals;
'sniff'[a]	*Hase*	'hare'	for hares and rabbits (usually not distinguished by adults);
[bə], [məm], [bəm], [ma]	*Baum*	'tree'	for the Christmas-tree; on the next walk for conifers (deciduous trees were not available); for all trees;
[bə], [bɪ],	*tööt*	when nudging the nose	when nudging her nose or other's noses, nudging when hearing the word;
[nana]	*Zahnbürste*	'toothbrush'	on seeing a toothbrush in a store, when referring to own toothbrush (dropped after several days);
[nana]	*Annalena*	child's name	photos of herself, not used for her belongings; all photos; to her photos, when seeing herself in a mirror etc.; to pictures of children;
[dada]	*Tag!*	greeting	as a greeting (later replaced by other forms);
[ja]	*ja*	'yes'	general answer to questions and in dialogues; when she wants to be picked up, accompanied by raising her arms; positive answer;
[bm]	*brumm/Auto*	'car'	all types of cars;
[aðða]	*Essen*	'meal'	to her meal (one single production), replaced by the word for bananas, three months later taken up again;
[bɪ]	*Bild*	'picture'	(framed) pictures on walls; to books and pictures; to a picture of a ball, to books (with pictures), to framed mirrors: to pictures;

[a] This is not a word but an idiomatic sound only listed for the sake of completeness.

clearly understood the word *Hund*. The connection between word and object was clear. The girl had several opportunities to imitate or spontaneously produce *Hund* in appropriate contexts. However, she looked at her parents in naming situations and deliberately turned her attention to other things. Similarly, Leopold (1939) noticed gaps in his daughter's vocabulary as striking. At the beginning of 0;11, A.'s grandmother told her about 'bowwows' (*wauwau*) and the child at once took advantage of the new term, not only in referring to dogs (real or in pictures or when hearing them (bark), but initially also for figures in animated cartoons (the situation in which *wauwau* was introduced). Only during the first days did she apply *wauwau* to people, cats and other animals. She used [vava], [wawa] daily, spontaneously, up to 1;2,26, when ['ɯnt], *Hund*, 'dog', became her word for dogs. It is evident, then, that at a time in which reference to objects was made, but the phonological system was not yet well developed, the production of a CVCC-construction with a breathed glottal fricative and a final consonant cluster /hʊnt/ (*Hund*, 'dog') was not possible. When a phonetically and structurally simple reduplicated baby talk form with labial fricatives was offered, the child at once made use of it. She now had a suitable instrument for expressing the withheld thoughts about dogs and related objects. The refusal to apply the word *Hund*, 'dog', was an example of the aforementioned Principle of Avoidance. It showed the girl's reluctance to produce sound combinations beyond her phonological level. After avoiding the complex pattern *Hund* she used a simpler sound sequence [vava], when it was offered. If mapping problems had been the reason for the avoidance, the child would not have used the substitute for dogs from the moment it was offered. Furthermore, the continuous refusal to imitate *Hund* until the beginning of 0;11 was remarkable. In general, the child imitated forms deliberately. There must have been reasons for withholding this term in particular. The girl already used several terms appropriately. She was able to map forms and classes of objects. Dogs were not exceptional animals in the child's life and reference by her conversational partners was regularly made. Thus, cognitive problems can be excluded. The prompt and consistent use of an articulatory more simple substitute makes phonetic reasons for refusing the target /hʊnt/ highly probable. The child made use of avoidance for phonological reasons. It will be shown that some overextensions made by A. may better be explained by a deliberate avoidance of a form than by erroneous attempts to map linguistic and non-linguistic knowledge, as hinted by Hoek, Ingram & Gibson (1986). The girl used the word that seemed most suitable (cf. Clark 1993) when pronunciation of the target term was not possible or inadequate for her.

Phonological overextension

A. was not consistent in referring to ducks. In addition to regularly seeing ducks in the park she cherished a musical toy duck. The form [bagba] appeared several times daily in conversations about real ducks, pictures of ducks, toy ducks and when hearing the word for ducks (/ɛntə/, *Ente*). The mapping of the child's form [bagba] to ducks and geese, that is, relatively big birds which mainly walk and swim and utter a special kind of noise, was regular and stable to the end of 0;11. However, none of the adults ever named ducks [bagba]. Towards the end of 0;11 the child often tried to imitate the target *Ente*, 'duck', e.g. [ejə], [dejə], [ɛīnə]. After imitating *Ente*, A. chose to apply the well-established [vava] when talking about her toy duck or real ducks in the park as well as in situations such as picture-book reading as the appropriate word was too difficult for her. Communication often was not successful because the parents interpreted [vava] as referring to dogs. Later A., rather than trying to establish a form resembling the adult one, spoke about ducks as [pɪpɪp]. In the course of 1;0, [pɪpɪp] was her expression for those birds which she saw flying and heard uttering chirping and cheeping noises.

At the end of 1;0 to the end of 1;1 no instance of [bagba] was recorded. During 1;2 A. called ducks as well as other birds [gaga(k)] (derived from the adult *gackgack*! 'cackling sound') and occasionally [bagba]. At the end of 1;2 her version of the adult form /fōgəl/, *Vogel*, 'bird' emerged: ['əg̩l̩], leaving [gagak] for ducks up to 1;3,3. Then she successfully produced adult-like forms [ænðə]. [ɛṫə]. From then on [gagak] appeared sporadically (up to 1;7), and now referred to the *sounds* made by ducks. The concept of ducks and geese was well developed by the middle of 0;11 as the child correctly applied her form to ducks and geese daily in different situations. The target word seemed to be too difficult. A structure $V_1C_1C_2V_2$ needed for an adult-like pronunciation of *Ente*, 'duck', was not present in the child's productive phonological system. She tried to pronounce it several times towards the end of 0;11. However, none of these forms were used regularly or spontaneously. A.'s self-constructed substitute was not found in the target language and the child was not encouraged in its use. As neither form satisfied the girl's needs – [bagba] was not used in the target language and /ɛntə/ was too difficult to produce – she applied a semantically related and well-established form which was consistent with her phonetic ability. Prior to the time when [vaval] 'dog' was used for ducks (a possible instance of overextension), the child had developed two separate concepts of ducks and dogs and had referred to

them with [bagba] and [vava] respectively. The former was never heard from others and therefore had to be rejected. This is an example of the shaping influence of the conversational partner's input on children's usage (cf. Clark 1993). A. overextended [vava] for phonological reasons. Probably her wish to talk was more important than adult-like articulation (see Günther: Stern & Stern 1928: 95). This can further be seen in the application of her self-created [bagba] and [bɔa] to fill the lexical gaps for ducks and crows and in the non-vocal sniff for hares. Similarly, Günther formed new words when needed (Stern & Stern 1928: 139f.). In each case the appropriate term was substituted by a simple form or even sound (in the case of hares), which enabled the child to speak of corresponding referents successfully. A.'s attempts to communicate about ducks using [vava] failed. She then used [pɪpɪ(p)], due to her still rudimentary phonology. This was another well-established expression, but not an adult-like version. Again two related concepts were joined in one form.

A. still did not retain adult-like expressions for *Vogel* 'bird' or *Ente* 'duck' although she regularly heard /fõgəl/ 'bird' and /ɛntə/ 'duck' from others. She presumably used [pɪpɪ(p)] as a homonym and not as a semantically overextended form. At 1;2 A. tried [gagak], again both for birds and ducks. This probably was not a case of overextension because the child used an adult-like term ['əg̩l] only for birds (flying, cheeping) and not for ducks from 1;2,28 on. She had felt the need to formally differentiate between birds and ducks. Her limited phonology prevented adult-like pronunciation but allowed for phonetically simple baby talk forms which functioned as a temporary compromise. Communicative pressure prompted A. to change the initial non-convential [bagba] to a misunderstood [vava] and again to an unsatisfactory [pɪpɪ(p)] and then [gagak]. That the child's overextended use of [vava] for ducks rested on an ill-developed concept of 'duck' is highly improbable, as before and afterwards ducks, birds and dogs were distinguished. Instead, it is suggested that A.'s word was used as a substitute because of phonological constraints. The concept 'duck' was well developed. A suitable form had to be found and successive steps were made in testing more or less appropriate forms which were then mapped on an already developed concept. Apart from semantic overextensions when referring to geese with the form for ducks, A. used phonological overextensions – [vava] for ducks – in order to maintain communication.

In conclusion, the data obtained in this longitudinal study show several possible reasons for overextensions. A word may be applied to referents for which adults would use separate terms because the child has an ill-developed concept, the need to fill a lexical gap or because of

difficulty in pronouncing the target form. As it is difficult to know the exact concepts children utilize, this knowledge must be deduced from children's language and information about situations in which words are uttered or not uttered. The present data provide a perspective on a child's phonological and lexical development with respect to context and allow the conclusion that phonological constraints may be responsible for some cases of overextension. However, more research is needed to show whether the observations for one child can be seen for other children as well. Especially useful are data from diary studies. In spite of recording limitations, difficulties in achieving reliability and the neglect of perception data, only diary studies provide us with daily recordings on the development of words in relation to several linguistic factors. Thus, items can be observed over a prolonged period of time in order to trace interrelations between linguistic systems because we need to know more about the interaction of different modules such as phonology, grammar and the lexicon. It is hoped that when more such corpora appear more examples of phonological overextensions will be found and more will be known about individual differences and variable strategies in moving into linguistic knowledge.

REFERENCES

Barrett, M. D. (1982). Distinguishing between prototypes: the early acquisition of the meaning of object names. In S. A. Kuczaj (ed.), *Language Development.* Vol. 1, *Syntax and Semantics* (Hillsdale, NJ: Lawrence Erlbaum).

Bloom, L. (1973). *One Word at a Time* (The Hague: Mouton).

Bowerman, M. (1978). The acquisition of word meaning: an investigation into some current conflicts. In N. Waterson & C. Snow (eds), *Development of Communication* (New York: John Wiley & Sons).

Clark, E. V. (1973). What's in a word? On the child's acquisition of semantics in his first language. In T. E. Moore (ed.), *Cognitive Development and the Acquisition of Language* (New York: Academic Press).

Clark, E. V. (1983). Meanings and concepts. In P. H. Mussen (ed), *Handbook of Child Psychology,* Vol 3 *Cognitive Development* (New York: John Wiley & Sons).

Clark, E. V. (1993). *The Lexicon in Acquisition* (Cambridge: Cambridge University Press).

Cruttenden, A. (1979). *Language in Infancy and Childhood* (New York: St. Martin's Press).

Drachman, G. (1973). Some strategies in the acquisition of phonology. *Working Papers in Linguistics,* **15**, 83–98.

Dromi, E. (1987). *Early Lexical Development* (Cambridge: Cambridge University Press).

Elsen, H. (1991). *Erstspracherwerb* (Wiesbaden: DUV).

Ferguson, C. A. & Farwell, C. B. (1975). Words and sounds in early language acquisition. *Language,* **51** (2), 419–439.

Grégoire, A. (1937). *L'Apprentissage du langage* (Liège/Paris: Librairie Droz).

Hoek, D., Ingram, D. & Gibson, D. (1986). Some possible causes of children's early word overextensions. *Journal of Child Language,* **13**, 477–494.

Leopold, W. F. (1939; 1949). *Speech Development of a Bilingual Child.* Vols 1, 3 (New York: AMS Press, reprint 1970).

Menn, L. (1978). Phonological units in beginning speech. In A. Bell & J. B. Hooper (eds), *Syllables and Segments* (Amsterdam: North-Holland).

Menyuk, P. Menn, L. & Silber, R. (1986). Early strategies for the perception and production of words and sounds In P. Fletcher & M. Garman (eds), *Language Acquisition* (Cambridge: Cambridge University Press).

Nelson, K. (1973). *Structure and Strategy in Learning to Talk.* Monographs of the Society for Research in Child Development, **38** (1–2), 1–135.

Nelson, K. (1974). Concept, word, and sentence: interrelations in acquisition and development. *Psychological Review,* **81**, 267–285.

Schwartz, R., Leonard, L B., Frome Loeb, D. M. & Swanson, L. A. (1978). Attempted sounds are sometimes not: an expanded view of phonological selection and avoidance. *Journal of Child Language,* **14**, 411–418.

Stern, C. & Stern, W. (1928). *Die Kindersprache* (Darmstadt: Wissenschaftliche Buchgesellschaft, reprint 1965).