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Lexical development in second language acquisition: initial stages in a Japanese child's learning of English*

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This Note reports a diary study of lexical development in the earliest weeks of acquisition of English as a second language by a 5-year-old Japanese girl. Lexical development has been largely neglected as a subject of second-language acquisition research (Hakuta & Cancino 1977, McLaughlin 1981). However, there are at least three basic areas in which L1 and L2 lexical development might differ: rate of vocabulary acquisition, composition of the lexicon, and overextension of word meanings. While these topics have been extensively studied in L1 acquisition (Carey 1982, Clark 1973, 1979, Nelson 1973, Rescorla 1980), they have not been systematically investigated in the field of second-language learning. There are only a handful of L2 studies which touch on vocabulary acquisition (Felix 1978, Hakuta 1974, Kenyeres & Kenyeres 1938, Vihman 1982) and only two L2 studies which have lexical development as their specific focus (van Helvert 1982, Yoshida 1978).

The existing literature suggests wide individual variation in lexical acquisition among children learning a second language. The range seems to extend from Felix's (1978) children, who learned no more than 40 different nouns or 20 different adjectives over a 5-month period, to Kenyeres' (1938) Eva, who acquired an extremely rich vocabulary in the same period of 5 months. At least three different strategies of L2 lexical acquisition are suggested by the existing data. Yoshida's (1978) 3-year-old Japanese boy apparently used a referential or nominal strategy, inasmuch as 60 % of the 300 words he learned in 7 months of acquisition were nominals and hardly any

were verbs. Vihman's (1982) daughter displayed a Gestalt-type strategy, with unanalysed multi-word units prominent in her lexicon. Hakuta's (1974) Uguisu and van Helvert's (1982) five Turkish children seem to have used a syntax-based strategy focused on verb and pronoun acquisition. Unfortunately, most of the studies which report any lexical data have not had vocabulary acquisition as a primary focus of the research, resulting in data which are sketchy and incomplete.

The subject of our case study is a 5-year-old child named Atsuko, who is the daughter of the second author, a linguist from Japan. Our aim in this paper is to describe Atsuko's early lexical development and to compare this process with lexical development in first-language learning. This Note covers data collected during Atsuko's first 11 weeks in the United States. There are three main sources of data for the research: Okuda's language diary of Atsuko's acquisition of English; formal audiotaped sessions, held approximately on a weekly basis, in which Atsuko interacted with the first author; and spontaneous play interactions between Atsuko and an American friend, observed and audiotaped by her mother in their home.

During the 11-week period which constitutes the time frame of this report, Atsuko was seen for 7 formal taping sessions. Lexical data from the language diary and from the adult and peer sessions were pooled to produce a chronological corpus of vocabulary acquisitions over these 7 temporal blocks. A word had to have been used spontaneously on at least two occasions before it was counted as a viable productive acquisition. Overextensions or other deviations from strict adult usage did not disqualify a word from inclusion in the corpus. Loanwords or cognates were included in the corpus if they were pronounced in roughly an English manner and not produced in the context of a Japanese utterance.

The words in the chronological vocabulary corpus were classified according to semantic class, using procedures outlined in Rescorla (1976). Formulaic expressions which initially appeared to be unanalysed wholes were counted as single lexical units, as in Vihman (1982) (*Hello, my name is Atsuko*; *see you tomorrow*; *come here*; *don't you do that*). When a word contained in such a multi-word lexical unit was used in a new and different context, that word was then counted as a discrete vocabulary item (e.g. *come* was credited after being used in *come here*, *come down* and *you coming*).

Each productive word was examined for the occurrence of overextended usage, using the procedures employed in Rescorla (1980). Overextension was defined as any use inconsistent with standard adult reference. A word was considered overextended if there was evidence of even one overextended usage. Overextensions were classified into Rescorla's (1980) three categories of overextension: categorical overinclusions, analogical overextensions, and predicate statements.

RESULTS AND DISCUSSION

Vocabulary acquisition

Atsuko learned 171 words in 11 weeks, using a conservative criterion of spontaneous and meaningful use on at least two occasions. There were an additional 80 to 90 words which we have a record of Atsuko using only once, but these are not included in the lexicon. Atsuko's first 75 words were acquired over a period of the first 7 weeks. The remaining 96 words were learned in the subsequent 4 weeks. Atsuko knew 16 of these 171 words before she arrived in America – 9 number terms, 2 letters, 2 colours, and the words *jump*, *Band-aid* and *cat*.

A clear factor in accounting for Atsuko's rapid acquisition of the first 75 words in her lexicon is the presence of Japanese–English cognates or loanwords. These are English words used regularly by Japanese speakers with a Japanese pronunciation (e.g. *dress* is said *dressu*). Loanwords constituted 24% of her first 75 words, as opposed to only 15% of the 91 words she learned in the second part of the time period. Atsuko was usually not aware that a Japanese word was a loanword until she stumbled on it accidentally. For instance, Atsuko was pretending to serve some food out of toy dishes and she asked her mother for the English words for *chokolaato aisu creemu*, discovering to her surprise that the English and Japanese words were the same.

We have contrasted Atsuko's vocabulary acquisition with that of a first-language learner, a child named Daniel who had the most rapid lexical and syntactic development of the 6 children in the Rescorla (1980) diary study of first-language acquisition. It took Daniel 14 weeks – or twice as long as Atsuko – to acquire 75 words. Even eliminating loanwords and previously known words from Atsuko's lexicon, she acquired 75 new words much more quickly than Daniel. It seems intuitively reasonable that an older child learning a second language will acquire vocabulary more rapidly than a young first-language learner, because the older child already has a fully developed conceptual system in his native language, as well as more developed memory skills.

Composition of the lexicon

The first 75 words Atsuko acquired were classified by semantic category, using the same taxonomy employed for first-language lexicons in Rescorla (1980). Atsuko's data and the comparable data for the 6 first-language learners appear in Table 1. The first major finding is that Atsuko had a lower percentage of general nominals in her early lexicon than the first-language children – 48% as opposed to 65%. It is important to note that the 6 first-language children in Rescorla (1980) were all firstborn, middle-class children, as is Atsuko, and that they were all REFERENTIAL speakers according to Nelson's (1973) criterion; that is, 50% or more of their vocabularies

TABLE I. *Percentage of vocabulary words by word class across acquisition*

Word class	L1 subjects First 75	Atsuko First 75	Atsuko Last 95	Total 171
Nominals				
Specific nominals	8	7	11	9
General nominals	65	48	36	42
People	2	4	3	4
Animals	12	1	2	2
Food	11	11	8	9
Clothing	5	3	0	1
Letters/Numbers	1	16	0	7
Natural objects/Places	9	4	4	4
Man-made objects	24	8	13	11
Actions/Activities	1	1	4	3
Abstract	0	0	2	1
Non-nominals	27	45	52	49
Modifiers (adj./adv.)	8	19	9	13
Verbs (main)		4	15	10
Interjections/Expressions		17	13	15
Pronouns	19	5	9	8
Auxiliary verbs		0	1	2
Conj./prep./art./Q-words		0	3	2

consisted of general nominals. Atsuko, on the other hand, fits the criterion for being an EXPRESSIVE speaker according to Nelson's typology, because fewer than half of her words were general nominals. However, she is unlike Nelson's expressive speakers in that she quickly acquired productive and creative syntax to accomplish her social-expressive aims, rather than relying on unanalysed ritual phrases as expressive speakers typically do.

Atsuko showed a strong referential inclination, but this did not take the form of object labelling, as it does in first-language learning. Rather, Atsuko seemed to take the topic or object referent for granted and then made some comment or observation about it, such as labelling its colour or saying she liked it. Thus, she seems to have had a different pragmatic orientation than Kenyeres' (1983) Eva, whose deliberate naming games suggest a referential strategy. Atsuko's nominal percentage is roughly comparable to those of van Helvert's (1982) 5 Turkish subjects, suggesting that this more expressive language style may be quite common in second-language learners.

Inspection of Table 1 reveals that Atsuko acquired relatively few words in the nominal word classes so popular with first-language learners, e.g. animals, clothing. In sharp contrast, 16 % of her early lexicon consisted of number and letter terms and 19 % of her first 75 words were modifiers, half of which were

colour names. These two substantial distributional differences seem to reflect a clear developmental difference between first- and second-language acquisition. The words Atsuko was concentrating on reflect her cognitive skills and interests, which are very different from those of a 12- to 18-month-old toddler.

Important changes in the composition of Atsuko's lexicon took place from week 7, the point at which Atsuko had 75 words, to week 11, when she reached 171 words. These changes in the lexicon are directly related to the strides she was making in syntax during this period from 7 to 11 weeks. While general nominals were 48% of the first 75 words, they comprised only 36% of the 96 words acquired in the following 4-week period. Formulaic expressions and interjections also declined in the latter acquisition period, although social phrases such as *let's go* and *see you tomorrow* continued to be present in Atsuko's lexicon. The word class which showed a dramatic increase during this period was verbs, going from 4% of her 75-word vocabulary to 15% of the next 91 words she acquired. The number of auxiliary verbs, conjunctions and prepositions also multiplied during this period, from 0% to 6%. The proportion of pronouns also almost doubled, going from 5% to 9%. This high proportion of closed class words, that is pronouns, auxiliary verbs, conjunctions and prepositions, is quite different from the pattern typically seen in the early stages of first-language vocabularies.

Overextension of words

Each of Atsuko's 171 words was examined for overextended usage. Only 19 words were never overextended, which constitutes 11% of her total lexicon of 171 words. Atsuko overextended 15% of her first 75 words, compared with 33% overextension in the 75-word vocabularies of the 6 children in the Rescorla (1980) study. Of Atsuko's first 75 words, 11 words were overextended at least once, with 3 of these words overextended in more than one way. All but one of these 15 overextended applications were classifiable according to the typology found in Rescorla (1980). This one exception was a phonological error – *grey* for *glue* – which is similar to phonological errors reported by Vihman (1981) and reflects the r/l phonological confusion so notable in Japanese learners of English.

Of the 14 classifiable overextended applications in Atsuko's first 75 words, 50% were categorical overinclusions – that is, overextension of a term to refer to a close relation of the standard referent in some clear taxonomic hierarchy. In the first-language vocabularies, 55% of the overextensions were of this type, such as *cat* for dog. Two of Atsuko's categorical overinclusions were similar to first-language ones (*mommy* for daddy and *Laurie* for a picture of a girl). However, the other 5 were very different from L1 categorical overinclusions, in that they were errors in use of colour terms, such as *black* for purple or *pink* for magenta.

The second type of overextension found was analogical, meaning that the word was used to refer to something which is not closely related to the standard referent in any clear categorical sense but rather shares some similar feature or characteristic with it. Fourteen per cent of Atsuko's overextensions were of this type, slightly less than the 19 % found in the first-language children. Both of Atsuko's analogical overextensions were clearly metaphors: her frequent use of *baby* for tiny objects such as dots and crumbs and her use of *mommy* for the middle-sized of 3 flowers.

Finally, Atsuko produced 5 predicate statement overextensions; that is, use of a word for a referent which bears some propositional relationship to the standard referent, such as possession, location or temporal contiguity. Thirty-six per cent of Atsuko's overextensions were of this type, somewhat higher than the 25 % found in Rescorla's (1980) first-language study. Atsuko's predicate statement overextensions were very similar in character to first-language predicate statements. She used *mommy* to refer to an origami flower her mother had made, *Laurie* for a ring similar to her friend's ring, *Christmas* for a picture of sledding, *baby* for a baby carriage she drew, and *apple* for apple juice.

Atsuko seemed to have a clear expectation that the concepts which she already knew how to label in Japanese would have equivalent English labels. For instance, she made 18 spontaneous metalinguistic statements over the first 11 weeks about the relationship between Japanese and English vocabulary (e.g. *mommy* means *okaasan*; *baby* means *akachan*; and *oh good* means the Japanese for *you do well*). There were 6 times when Atsuko was puzzled about Japanese–English mapping, such as when she asked her mother 'Do you say *night-night* for *sayonara*?'. We also have a record of 13 times when Atsuko asked her mother for an English translation of a Japanese word she wanted to use, such as *tree.*

Thus, overextension was much less prevalent in Atsuko's lexicon than it is in first-language learners. Most of her categorical overextensions were fairly subtle errors in the application of colour terms, not surprising at her age. When these are excluded, the preponderance of her overextensions were either analogical-metaphorical statements or else pre-syntactic attempts to convey propositional relations between referents. Finally, Atsuko had no persisting overextensions, that is, use of a word like *dog* to refer to many different animals over a period of weeks. In sum Atsuko did relatively little labelling and concentrated instead on commenting on a wide variety of referents using the small stock of words she knew.

To conclude, Atsuko's data indicate a different pattern of lexical acquisition from that typically found in first-language learners. First, Atsuko's lexical acquisition proceeded much more rapidly. Secondly, nominals were much less prominent and verbs, pronouns and modifiers were much more numerous in Atsuko's lexicon than they usually are in first-language vocabularies. While Atsuko's general nominal percentage is similar to that of L1 expressive

children, her productive use of verbs and pronouns and her acquisition of modifiers are not typical of early L1 acquisition. Finally, overextensions and overinclusive categorizing were much less frequent and persistent than in first-language vocabularies.

It seems likely that Atsuko's pattern of lexical acquisition is just one of many possible patterns which second-language learners might employ. It will be important in future research to see how personal and social characteristics of the learner influence lexical selection, both within and between such word classes as nominals, verbs and closed class terms. Additionally, it will be important to replicate our finding of a relatively low rate of overextension of words in L2 acquisition, using larger samples of L2 learners. In summary, this research shows that issues such as lexical strategy and overextension which have been important in L1 lexical development are also quite relevant to L2 vocabulary acquisition.

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