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論文集

Basic Level Effects in Taiwanese Noun Acquisition

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Basic level effects were found in the results of an analysis of a sample of Taiwanese children's spontaneous speech from 2;1 to 4. Basic level terms developed first, subordinate second and superordinate terms were acquired last. Basic level terms were used most often by children across all stages.

BASIC LEVEL EFFECTS

Table 1

Characteristics of categories at three levels (Ungerer & Schmid, 1996:98)

	Parameter				
Type of category	Gestalt	Attributes	Category Structure	Function	Linguistic form
Basic level categories	Common gestalt	Large number of category-wide attributes	Prototype structure	'natural' access to the world	Short, monomorphemic words
Superordinate categories	No common gestalt	One or very few category-wide attributes; salient general attribute(s)	Family resemblance structure	Highlighting and collecting function	Often longer, morphologically complex words
Subordinate categories	Almost identical gestalt	Large number of category-wide attributes; salient specific attribute(s)	High degree of homogeneity among category members	Specifying function	Often morphologically complex words

Objects can be categorized at different hierarchical levels. Rosch, Mervis, Gray, Johonson and Boyes-Braem (1976) claims that there is a basic level at

which human beings tend to represent objects in the world. At the basic level, objects are perceptually similar with another object within the category, but distant from objects in other categories. The basic level lays between the superordinate and subordinate levels. For example *lily* is at subordinate level, *flower* is at basic level, and *plant* is at the superordinate level. The types of categories are defined by the parameters shown in Table 1.

Basically, basic-level effect is a universal phenomenon existing in every human language. The centrality of basic level is because it meets our basic cognitive needs for three psychological factors. (Brown, 1958 and Kay, 1971). The first one is that the basic level is where we can obtain an item's largest amount of information with least cognitive effort, which conforms to cognitive economy. Second, at basic level, the common overall shape of an item can be seen holistically. For example, at superordinate level, it will be very difficult to imagine an overall shape for a word like animal. Finally, the third factor concerns with action. At basic level, we can obtain a characteristic action for any kind of animal. For instance, cats can be stroked, and balls can be rolled.

Researchers have found that children have the basic-category bias by preschool age. Waxman (1999) argued that object categorization and naming are tightly linked and showed that the names for basic-level categories are learned before those of other categories. Most of the children studied on basic level effects have been with English speakers though important similarities and differences have been found in the role of different types of labels play in categorization by French and Spanish speaking children (Waxman, Senghas & Benveniste, 1997). Jiang (2000) also did some research on basic-level effect and confirmed its existence in Mandarin Chinese lexicon. We expand the research to Taiwanese speaking children to offer additional evidence for basic level effects with corpus analysis.

Before getting into methodology, a comparison of experimental approach and corpus-based approach is provided. Experiments such as those conducted by Waxman (1999) and Waxman, Senghas & Benveniste (1997) have the advantages that each the assumption was tested by experiments specifically designed for it. In this way, we can know clearly which assumption is truly applied by children. The disadvantage is that children's production is elicited, which might be different

from natural speech. The disadvantage of a corpus-based approach is that we cannot test certain assumptions particularly. However, at least, we can get a general tendency of language development to see if children's development really conforms basic level effects or not. Also, corpus database provides spontaneous production of children's speech, which is exactly from their real daily speech. Therefore, in the present study, we took a corpus-based approach, different from previous experimental research, to see if we can obtain convergent evidence for basic level effects.

METHOD

Participants

Table 2

MLU in each month's data for the participants

Age	child	
	TWX	HBL
1;5	1.3	
1;6	1.5	
1;7	1.8	
1;8	2.0	
1;9	2.3	
1;10	2.2	
1;11	2.2	
2;0	2.3	
2;1	2.4	1.8
2;2	2.3	1.9
2;3	2.2	1.9
2;4	2.1	1.9
2;5	2.3	2.2
2;6	2.4	2.2

Table 2

MLU in each month's data for the participants (continued)

2;7	2.6	2.5
2;8	2.7	2.5
2;9	2.5	2.8
2;10	2.6	2.7
2;11	2.7	2.5
3;0	2.4	2.4
3;1	2.9	2.7
3;2	3.3	2.8
3;3	2.9	2.7
3;4	2.8	3.1
3;5	2.4	2.6
3;6		2.8
3;7		2.7
3;8		2.9
3;9		3.1
3;10		2.8
3;11		2.9
4;0		2.7

The source of our data is the Taiwan Child Language Corpus (Tsay, in progress) consisting of longitudinal collection of children's natural speech. These children were acquiring Taiwanese as their first language.   The data were tape recorded every two weeks at the participants' home and then transcribed.   Each period last for 40 minutes on average.   We analyzed the language samples produced by a girl, TWX from 1;5 to 3;5 and a boy, HBL from 2; 1 to 4;0.   These two children were chosen because other children's data had not been completely tagged. HBL's data composed of 45 sessions, totally 1889 minutes.   TWX's data included 44 sessions, totally 1829 minutes. The Mean Length of Utterance (MLU) in each month's data for each child was given in Table 2.   We can see that the girl, TWX's language developed faster than the boy,

HBL.

Data analysis

A computer program, SPEECH SELECTION, was used to extract HBL's and TWX's speech from other people's speech that was included in their recording, such as their family members. Then, another program, WORD CLASS, was used to divide every syntactic category, such as nouns, verbs and so on. After selecting nouns, we chose lexical items tagged as NA, consisting of object names.

In order to see the developmental trend more clearly, we divided the total duration of data collection into six-month periods: 1;5-2;0, 2;1-2;6, 2;7-3;0, 3;1-3;5, 3;6-4;0.   Basic level effects were operationalized by the nouns acquired and the nouns used.   The former were represented by type frequency while the later by token frequency.

RESULTS AND DISCUSSION

For both children, basic-level terms constituted most of the nouns produced by the children across all stages.   Basic level terms developed first, subordinate second and superordinate terms were acquired last.   Basic level terms were used most often by both children.

In the first recording at 1;5, TWX produced no superordinate or subordinate terms.   57% of the nouns produced were basic level terms, totally 28 tokens such as 魚 hi5 'fish' and 帽仔 bo7a2 'hat'. 43 % were kinship terms such as 媽媽 ma9ma9 'mother' and 哥哥 ko1ko1 'elder brother' which were not grouped into any levels.   The first superordinate term, 涼 e0 liang5e0 'beverage' occurred at the age of 1;6.   The first subordinate term, 竹筍 tik4sun2 'bamboo shoot' also appeared at 1;6.

On the other hand, HBL's recordings started at the age of 2;1.   At that time, 69% of the nouns produced were basic level terms, totally 80 tokens such as 牛 gu 5 'cow' and 冊 cheh4 'book.'   27.6% were kinship terms such as 阿祖 a1coo2 'grand grandfather' and 阿媽 a1ma2 'grandmother' Only one superordinate term

was found, which was also 涼 e0 *liang5e0* 'beverage' like TWX. The first subordinate term was 關刀 *kuan1to1* 'saber' observed at 2;1.

Type Frequency

Type frequency is the number of different nouns used. If a noun appears twice, only one is counted. Thus, type frequency reflects the number of nouns children have acquired. Table 3 shows the type frequency by TWX from 1;5 to 3;5.

Table 3.

Type frequency by TWX 1;5-3;5

type frequency	TWX-1;5-2;0		TWX-2;1-2;6		TWX-2;7-3;0		TWX-3;1-3;5	
superordinate	2	0.42%	2	0.41%	0	0	1	0.26%
basic	345	72.63%	361	73.98%	384	77.89%	316	81.03%
subordinate	43	9.05%	63	12.91%	63	12.78%	18	4.62%
kinship	85	17.89%	62	12.70%	46	9.33%	55	14.10%
sum	475		488		493		390	

Table 4.

Examples produced by TWX

Age	Language	superordinate	basic	subordinate
	Taiwanese	liang5e0	ne1ne1	chau3tau7hu7
TWX-1;5-2;0	English	beverage	milk	processed tofu
	Taiwanese	ki1	chiu7a2	ong5lai5piann2
TWX-2;1-2;6	English	machine	tree	pineapple cake
	Taiwanese		sann1	gu5ling1hun2
TWX-2;7-3;0	English		clothes	Milk powder
	Taiwanese	cui2ko2	chiu2	hue2chia1
TWX-3;1-3;5	English	fruit	hand	train

Across all four stages, basic level terms dominate TWX's noun acquisition. Basic level terms constitute 72.63% of the nouns acquired at 1;5-2;0, 73.98% at

2;1-2;6, 77.89% at 2;7-3;0, and 81.03% at 3;1-3;5. Kinship terms made up of the second big portion. There were also some subordinate terms. Superordinate terms were very few, at most two. Some Examples produced by TWX were given in Table 4.

On the other hand, the type frequency of HBL shows similar results as given in Table 5.

Table 5.

Type frequency by HBL 2;1-4;0

Type frequency	HBL-2;1-2;6		HBL-2;7-3;0		HBL-3;1-3;6		HBL-3;7-4;0	
superordinate	2	0.48%	2	0.41%	1	0.25%	2	0.46%
basic	324	78.07%	374	77.27%	293	74.37%	337	77.29%
subordinate	26	6.27%	51	10.54%	43	10.91%	53	12.16%
kinship	63	15.18%	57	11.78%	57	14.47%	44	10.09%
	415		484		394		436	

Table 6.

Examples produced by HBL

Age	Language	superordinate	basic	subordinate
	Taiwanese	liang5e0	chiu2	poo3e5a2
HBL-2;1-2;6	English	beverage	hand	sneakers
	Taiwanese	liang5e0	lang5	oo0to0bai0
HBL-2;7-3;0	English	beverage	person	motorcycle
	Taiwanese	liang5e0	thang5	phainn2lang5
HBL-3;1-3;6	English	beverage	worm	bad person
	Taiwanese	liang5e0	ciap4	ong5lai5ciap4
HBL-3;7-4;0	English	beverage	juice	pineapple juice

Basic level terms also dominate HBL's noun acquisition across all four stages. Basic level terms constitute 78.07% of the nouns acquired at 2;1-2;6, 77.27% at 2;7-3;0, 74.37% at 3;1-3;6 and 77.29% at 3;7-4;0. Kinship terms constitute the

second big proportion.   There were some subordinate terms, which increased by age.   Superordinate terms were very few, at most two.   Some examples produced by HBL were give in Table 6.

Token Frequency

Token frequency is the number of tokens that appear in the conversation.   If the same noun appear twice, two were counted.   Thus, token frequency reflect how often children use the nouns.   TWX's token frequency is given in Table 7.

Table 7.
Token frequency by TWX 1;5-3;5

token frequency	TWX-1;5-2;0		TWX-2;1-2;6		TWX-2;7-3;0		TWX-3;1-3;5	
superordinate	4	0.34%	2	0.19%	0	0	4	0.45%
basic	743	63.23%	717	67.45%	826	79.35%	630	70.79%
subordinate	68	5.79%	134	12.61%	116	11.14%	42	4.72%
kinship	360	30.64%	210	19.76%	99	9.51%	214	24.04%
Sum	1175		1063		1041		890	

Table 8.
Token frequency by HBL 2;1-4;0

token frequency	HBL-2;1-2;6		HBL-2;7-3;0		HBL-3;1-3;6		HBL-3;7-4;0	
superordinate	2	0.18%	2	0.14%	1	0.09%	2	0.18%
basic	784	69.01%	1043	73.81%	883	78.63%	835	77.03%
subordinate	64	5.63%	173	12.24%	86	7.66%	113	10.42%
kinship	286	25.18%	195	13.80%	153	13.62%	134	12.36%
Sum	1136		1413		1123		1084	

Basic level terms were used most often by TWX across all four stages.   Basic level terms constitute 63.23% of the nouns produced at 1;5-2;0, 67.45% at 2;1-2;6,

79.35% at 2;7-3;0 and 70.79% at 3;1-3;5.   Kinship terms were used less often.   Subordinate terms were used sometimes.   Superoridate terms were rarely used.

Basic level terms were also used most often by HBL across all four stages as shown in Table 8.

Basic level terms constitute 69.01% of the nouns produced at 2;1-2;6, 73.81% at 2;7-3;0, 78.63% at 3;1-3;6 and 77.03% at 3;7-4;0.   Kinship terms were used less often.   Subordinate terms were used occasionally.   Superoridate terms were rarely used.

Frequent Categories

All nouns were classified into 22 categories and most of them are adopted from Jiang's (2000) classification, including 17 categories, animal, fruit, food, body part, toy, clothes, vehicle, natural phenomenon or substances, tool, stationery, electrical product, insect, vegetable, plant, color, tableware and musical instrument. The other 5 categories are furniture or house, title, figure, abstract nouns, machine or lively commodity. If Jiang's (2000) 21 categories are all adopted, it might cause some difficulties in classifying our children's data. Therefore, some revision of scope in certain categories was made to include every noun in classification.

If we compare Jinag's (2000) eight most frequent categories with TWX's and HBL's, there are some overlapping categories, including animal, food, body part, natural phenomenon or substance, fruit and vehicle. Basically, nouns that occur most frequently are almost identical. Thus, a generalization can be made that objects that children contact most often are usually most frequently produced no matter in which language.

Nouns in all the semantic domains are classified by superordinate, basic, and subordinate levels, except for title, figure, and abstract nouns. Most words in thoser categories are basic-level words, because they don't have distinctive features so it's difficult to make classification or is unnecessary to be classified. Therefore, only 19 categories are classified here.

Basic level terms dominate the total number of nouns. The classification of concrete nouns produced by TWX was given in Table 9, and that by HBL was

given in Table 10.

Table 9

TWX's nouns by categories

Category	Superordinate	Basic	Subordinate
animal	0	54	16
commodities	2	35	6
food	2	64	35
body part	0	31	6
vegetable	0	22	7
natural phenomenon or substance	0	18	
fruit	0	20	1
vehicle	0	4	6
toy	0	3	
clothes	1	15	6
insect	0	3	0
furniture or construction	0	10	2
electrical product	0	12	4
tool	0	20	0
tableware or cooking ware	0	13	2
stationery	0	7	5
color	1	13	0
plant	0	0	6
musical instrument or products	0	4	0
Sum	6	348	25

Table 10

HBL's nouns by categories

Category	Superordinate	Basic	Subordinate
animal	1	87	25
commodities	2	66	0
food	4	61	0
body part	1	45	0
vegetable	1	42	0
natural phenomenon or substance	0	37	0
fruit	0	32	0
vehicle	0	26	1
toy	1	23	0
clothes	0	18	2
insect	0	17	0
furniture or house	0	17	0
electrical product	0	16	0
tool	0	15	4
Tableware or cooking ware	0	15	0
stationery	0	13	0
color	2	13	2
plant	0	11	0
musical instrument or products	0	1	0
Sum	12	555	34

CONCLUSION

We can see that the basic level has been established in Taiwanese children's lexicon. TWX's and HBL's production shows that they have also begun to acquire superordinate and subordinate level categorizations. In spite of this, words at basic

level still dominated the noun lexicon and were used more frequently. Subordinate-level categories are described with finer characteristics, which are more difficult to distinguish. Members of superordinate-level words do not share perceptually salient commonalities, so the concepts are more difficult for children to acquire. The corpus analysis of two Taiwanese speaking children provide evidence that basic level effects exist in Taiwanese. More researches of other language are encouraged in basic-level effects, which is a very important human cognitive ability.

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