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On Lexicalization Pattern of Caused Motion Events by Chinese Children

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Abstract: The lexicalization of Chinese motion events has been a controversial topic. Most of previous studies on the lexicalization patterns of Chinese movement events has been conducted with laboratory experiments, leaving the natural Chinese motion events in daily life unstudied. Therefore, this paper investigates the language acquisition process of Chinese children resulting in movement events based on naturalistic data of language development from 13 to 48 months in Mandarin-speaking children SWK, which greatly reduces the influence of human factors on the findings. The results showed that 1) path verbs developed slightly faster than manner verbs at all times. Besides, both kinds of verbs develop fastest at the age of 2-3 years, and peak at the age of 3 years. 2) Modern Chinese exhibits the characteristics of a satellite-framed language in some aspects. 3) Caused motion events develop slower than voluntary motion events.

Keywords: Caused motion events; Lexicalization pattern; Chinese children.

1. Introduction

Since Talmy [1] [2] distinguished the world's major languages into "verb-framed language" and "satellite-framed language" from the perspective of linguistic typology. With respect to motion events, researchers at home and abroad have done a lot of researches on the issue of lexicalization of motion events in Chinese. However, so far, the scholars have not yet reached a conclusion on the attribution of Chinese. And the results of these studies are widely divergent, including "satellite-framed language theory", "verb-framed theory language theory" and "equipollent-framed language theory", etc. Most of the existing empirical studies have focused on the characteristics of self-motorized sports events [3] [4] [5], and few studies have explored the type attribution of Chinese by exploring the characteristics of different types of sports events [6]. Moreover, most of the above conclusions are based on non-empirical inferences, without collecting and analyzing the idiomatic usage of Chinese expressions of motion events. So, there is little research on the lexicalization pattern of Chinese caused motion events and data which were used in most of previous researches are not natural data, but the elicited data through laboratory experiments. Based on this, this paper adopts an empirical approach to collect the natural corpus of children's expressions of motion events by using the Chinese Children's Multimodal Speech Language Corpus, which is built by the Cognitive Science and Language Aptitude Platform of the School of Foreign Languages, Linyi University, China, with the aim of further revealing the lexicalization characteristics of motion events in Chinese. Specifically, this study intends to study the language acquisition process of Chinese children's caused motion events by recording and analyzing the natural language of a 1-4-year-old Mandarin child. The video records the development of child's natural language, which greatly reduces the influence of human factors on the research results. By using the natural data, this thesis intends to analyze the lexicalization pattern of Chinese caused motion events of children and to study the language acquisition process of Chinese children's caused motion events. To serve the research objective of this thesis, we have addressed the following two research questions by analyzing the data of the corpus: 1) How do children acquire the language expression of caused motion events? 2) In the development of motion events language expression of the 1-4 years old child, which development is better, voluntary motion events or caused motion events?

2. Literature Review

A motion event refers to "a continuous scene including motion and state" [1]. Motion can be further divided into displacement motion and self-sustaining motion. The former means that the spatial position of the object has changed, while the latter means that the spatial position of the object remains unchanged, but it is in a continuous state (vibration, rotation, expansion, extension, and contraction). In this thesis, what we are concerned about is the former kind of motion that occurs displacement. It was Talmy who was the first to work on motion events and then it was discussed by lots of linguists.

A motion event consists of four main parts: the moving object "Figure", the reference object "Ground", the object "Motion" and the motion "Path", which reflect the motion or place of the object. With respect to motion events, verbs mainly express the core meaning of motion or place, and express the cause, manner, or path of motion events, which is a combination of two or even more semantic components. The framework of motion events also includes two optional components: manner and cause.

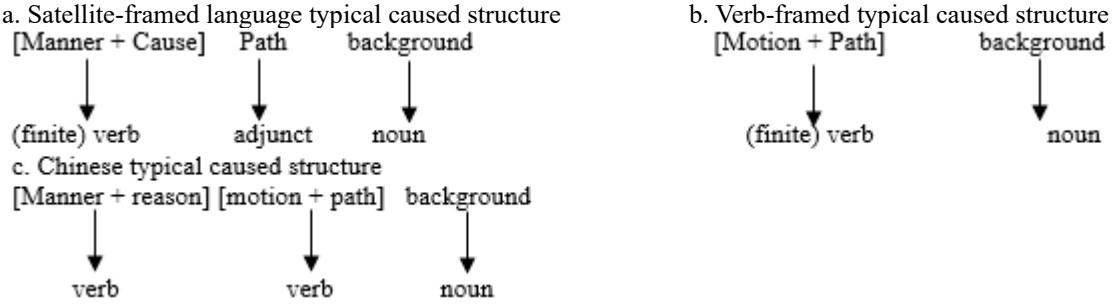
When describing motion events, all these semantic components need to be expressed in language form, and the lexicalization modes of different languages are different. By describing and analyzing the frames of motion events in different languages, Talmy found that each language has its own unique way of expression, and put forward a language type-dichotomy model, which holds that languages belong to "verb frame language" and "satellite frame language".

Slobin, however, thought that Talmy's dichotomy can't cover all commonly used languages, so he developed the

trichotomy based on Talmy's dichotomy and added "equipotential frame language" to include articulated language, two-word verb language and so on [7]. Its path and manner are usually expressed by two verbs that have the same lexical and syntactic status and can be used independently.

The motion event is divided into caused motion event and voluntary motion event. The caused motion event is the event complex composed of the event and the caused event. A caused motion event refers to the motion that the agent (usually animate) causes other entities (usually inanimate) to change their spatial position, such as "I put the cup on the table". A voluntary motion event refers to the motion that a living body spontaneously changes its spatial position, such as "he walks into a shop".

By analyzing the syntactic features of Chinese typical caused structures, it was found that they are different from English and Spanish in typological sense [8]. The differences can be clearly expressed by the following structures.



From the perspective of children's nonverbal thinking, for example, Ji Yinglin and Jill Hohenstein found that children's non-linguistic thought is similar prior to the internalization of the lexicalization patterns of motion events in their native languages, and language structure may affect the pattern of nonverbal thinking, by testing how monolingual children who speak languages with partial typological differences in motion description (English and Chinese) respond to visual motion event stimulus [9]. Aktan-Erciyes and his colleagues found that early detection of event components is associated not only with verb comprehension, but also with how children lexicalize event components in line with their native language, by some tests on children [10]. Zheng Mingyu suggested that these deaf children convey in their gestures thus appear to serve as a starting point and perhaps a default for all children as they begin the process of grammaticalization – thoughts that have not yet been filtered through a language model, by exploring how deaf children in two different cultural and linguistic environments (Chinese and American) expressed motion events at an early stage in their language development[6].

From the perspective of language type attributes, for example, Ochsenbauer found that children construct spatial representations in accordance with the properties of their mother tongue, by a test on a corpus elicited from German children and adults who had to verbalize short animated cartoons showing motion events, and the results are compared with previous analyses of French and English corpora elicited in an identical situation [11].

From the perspective of language specificity and generality, for example, Maya Hickmann, Henriëtte Hendriks found that the impact of language specific factors on language acquisition, by comparing the productions of French children aged 3, 4 and 5 years with those of French and English adults in two tasks that required them to locate objects and to describe object displacements [12].

From the perspective of the expression and spontaneity of motion events, for example, Ji Yinglin [13], Henriette, Hendriks, Maya, Hickmann, revealed the important role of language uniqueness factors in language acquisition, by discussing how English and Chinese children express voluntary motion events based on animation. Wu Dandan [14], Li Hui, Sheila Degotardi found that fathers' daily time with children and the frequency of parents' television watching with children were positive predictors for early motion events production, by exploring Chinese preschoolers' expression of motion events in a toy-play context. M Gullberg [15] highlighted implications for our understanding of speakers' representations and their developments, by exploring how French adults and children aged four and six years talk and gesture about voluntary motion.

To sum up, by collecting information on lexicalization of motion events by Chinese children in recent years, it is found that scholars had studied language typology, coding of motion events, language acquisition and so on. However, the data used in most previous studies is not natural data, but the elicited data through tests. Therefore, this thesis intends to study the language acquisition process of lexicalization of Chinese children's motion events through natural data which is from the Chinese Children's Multimodal Speech Language Corpus, which is built by the Cognitive Science and Language Aptitude Platform of the School of Foreign Languages, Linyi University, China.

2.1. Methodology

The corpus approach is a main method used for the present study. The corpus is collected by team members who went to the children's home every weekend to record video for one hour without interruption. The video recorded the children's daily life, including the natural interaction between children and parents, without other interference. Sometimes children didn't talk for a long time, and adults may break the deadlock by asking questions or providing toys, but these behaviors had no special purpose to test children's language knowledge. The data used for this paper is from SWK's corpus, starting from 1 year, 1 month and 12 days (1;1;12) to 3 years, 12 months and 28 days (3;12;28). The child's main caregivers are mother and father. She began to attend kindergarten at the age of 3 years and 2 months, and her language environment is Mandarin. Children's main contacts all speak Mandarin, and the dialects of parents, grandmothers and grandfathers are all northern dialects, but they all use Mandarin when communicating with SKW. The research was based on corpus, so the selection of corpus is the cornerstone of the whole research, and it is necessary to define and explain the expected selection criteria. Our research object is mainly the

path verbs that children output independently.

According to previous classification standards, the path verb can be divided into three categories: leaving verb, crossing verb, and arriving verb. Leaving verbs mainly uses “出 (exit)”, “掉 (fall)”, “开 (open)”, “跑 (run)”, “起 (rise)”, “下 (down)”, “走 (go)”, totally seven words; The crossing verbs only uses “过 (pass)”; The arriving verbs mainly uses six words: “回 (return)”, “进 (in)”, “上 (up)”, “在(at)”, “到 (to)”, “倒 (fall)”. There are fourteen words are in all.

Chu (2004) mentioned that in colloquial Mandarin, there is no verb that expresses ‘pure’ move; the so-called motion verbs do conflate with path, manner, or any other move-related conceptual elements. For the purpose of examining the diversity and frequencies of different types of motion verbs, all motion verbs used in the descriptions of motion events of the corpus were observed and coded. Four categories were identified according to their meaning of motion; examples are shown as follows:

(1) Types of motion verbs:

A. path verbs

a. non-deictic path verbs: e.g., 掉 diào (fall)

b. deictic path verbs: e.g., 来 lái (come)

B. manner verbs: e.g.,跑 pǎo (run)

C. cause verbs: e.g., 推 tuī (push)

D. neutral verbs: e.g., 坐 zuò (sit)

In Mandarin, a serial of motion verb constructions generally allow a maximum of three verb types; any of the three verbal components can also form two-component constructions, or occur alone. Examples of motion verb constructions in the corpus are given below:

(2) Types of motion verb constructions:

A. path

出 chū (exit)

B. path + path (deictic)

出来 chū lái (exit and come)

C. manner + path

跳下 tiào xià (jump down)

D. cause + path

推掉 tuī dào (push arrive)

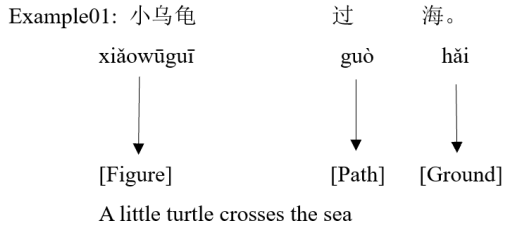
E.manner+path+path(deictic)

跳下来 tiào xià lái (jump down)

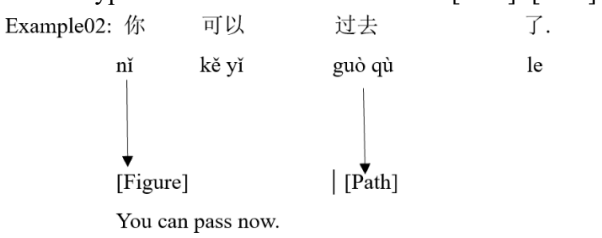
F. cause + path + path(deictic)

推进去 tuī jìn qù (push in)

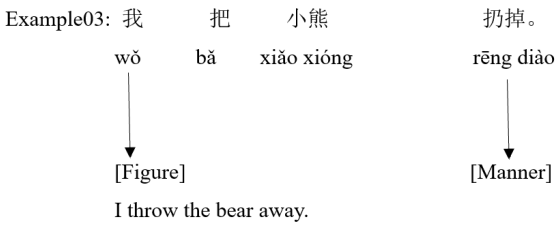
The type of motion verb construction: [Path]



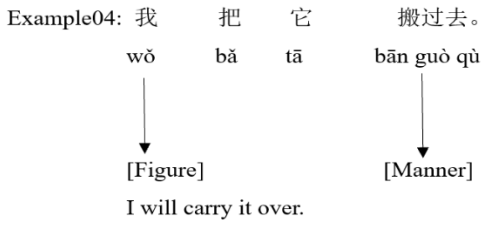
The type of motion verb construction: [Path]+[Path]



The type of motion verb construction: [Manner]+[Path]



The type of motion verb construction: [Manner]+[Path]+[Path]



In the process of corpus coding, clauses are taken as the analysis unit, that is, each clause contains only one predicate, and each predicate only expresses one situation. For the purpose of examining the diversity and frequencies of different types of motion verbs, all motion verbs used in the motion event descriptions of the corpus were identified and coded.

2.2. Results and Discussion

Characteristics of the Use of Caused Motion Verbs. According the data of the corpus, we found that the following cause verbs are used in the corpus, totaling 33 types:

Table 1. Motion verbs indicating “cause” by SWK

抱 bào (embrace)	推 tuī (push)	抓 zhuā (grab)	掉 diào (fall)	扔 rēng (throw)
倒 dào (pour)	投 tóu (cast)	丢 diū (throw)	扫 sǎo (sweep)	放 fàng (put)
吹 chuī (blow)	拿 ná (take)	捡 jiǎn (pick up)	搬 bān (carry)	提 tí (lift)
撞 zhuàng (strike)	碰 pèng (touch)	拍 pāi (pat)	踹 chuài (kick)	翻 fān (turn over)
踢 tī (kick)	抢 qiǎng (rob)	抠 kōu (dig out)	挖 wā (dig)	撕 sī (tear)
摘 zhāi (pick)	拔 bá (pull out)	切 qiē (cut)	掀 xiān (lift)	赶 gǎn (drive away)
滑 huá (slide)	冲 chōng (wash away)			

The occurrence time of the first caused motion event is1;10;14. The information is “mā ma bào zhe”, which means that his mother holds him. The acquisition time of the first caused motion event is1;10;20. The information is “妈妈抱着葡萄”, which means that he wants his mother to hold grapes. (In this thesis, we take the third occurrence time of the same word as the acquisition time. The learning of motion verbs in Chinese can be examined in two ways: the development of motion verbs lexicon along with the use of different types of motion verbs (i.e., cause verbs versus path verbs), and the development and use of different verb combinations (particularly cause expressions versus path expressions).

Table 2 summarizes the results concerning the development of different types of motion verbs as is reflected in corpus. According the following table, we know that across age groups, the lexicon of cause verbs is always larger than that of path verbs. In other words, there are more different types of cause verbs than those of path verbs.

Table 2. Results concerning the development of different types of motion verbs as is reflected in corpus

	1yrs-2yrs	2yrs-3yrs	3yrs-4yrs
Cause Verb(type)	35	86	60
Path Verb(type)	23	24	25
Total(type)	58	110	85

Figure 1, on the other hand, summarizes results about the development and use of cause expressions and path expressions in corpus.

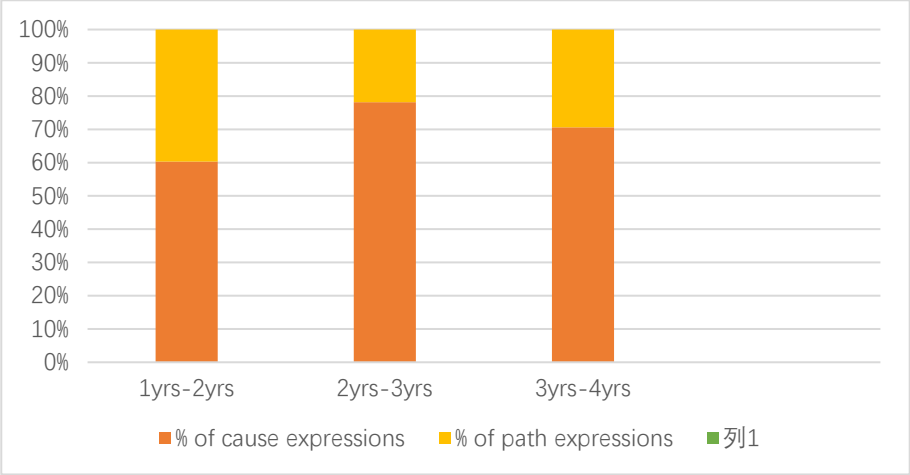


Figure 1. The frequency of cause and path expressions

Therefore, according to the data in the above table and figure, we can draw the conclusion that across age groups, the lexicon of cause verbs is always larger than that of path verbs.

Table 3. The token frequencies of Path Verb and Cause Verb

	1yrs-2yrs	2yrs-3yrs	3yrs-4yrs
Path Verb	74	165	129
Cause Verb	27	118	106

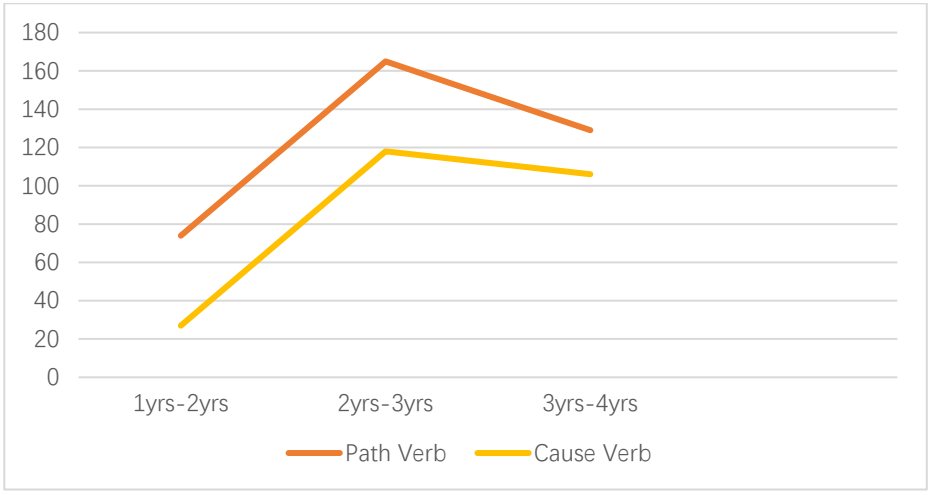


Figure 2. The development of Path verb and Cause verb

Figure 2, on the other hand, demonstrates the development of token frequencies of motion verbs (Path Verb and Cause

Verb) of caused motion events in the corpus. According to the figure, we can see that path verbs and cause verbs all develop fastest during the period of 2-3 years old, and the token frequencies reaches the highest at the age of 3.

To sum up, according to the above data analysis, we draw the following conclusions: across age groups, the lexicon of cause verbs is always larger than the lexicon of path verbs. The two kinds of verbs develop most rapidly at the age of 2-3, and the number reach the peak at the age of 3.

Types of Caused Motion Events Construction. According to statistics, there are 101 caused motion events during the period of 1-2 years old. Among these caused motion events, 55 caused motion events are expressed by Path only,19 caused motion events are by Path+ Path (deictic), 16 caused motion events are by Cause + Path, and 11 caused motion events are by Cause + Path + Path (deictic). There are 283 caused motion events during the period of 2-3 years old. Among these caused motion events, 98 caused motion events are expressed by Path only, 67 caused motion events are by Path+ Path (deictic), 57 caused motion events are by Cause + Path, and 61 caused motion events are by Cause + Path +Path (deictic). There are 235 caused motion events during the period of 3-4 years old. Among these caused motion events, 74 caused motion events are expressed by Path only, 55 caused motion events are by Path+ Path (deictic), 68 caused motion events are by Cause + Path, and 38 caused motion events are by Cause + Path + Path (deictic). As shown in the following table 4:

Table 4. The token frequencies of different constructions of caused motion events

Constructions	1yrs-2yrs	2yrs-3yrs	3yrs-4yrs
Path	55	98	74
Path + Path (deictic)	19	67	55
Verb +Path	16	57	68
Verb +Path+ Path(deictic)	11	61	38
Total	101	283	235

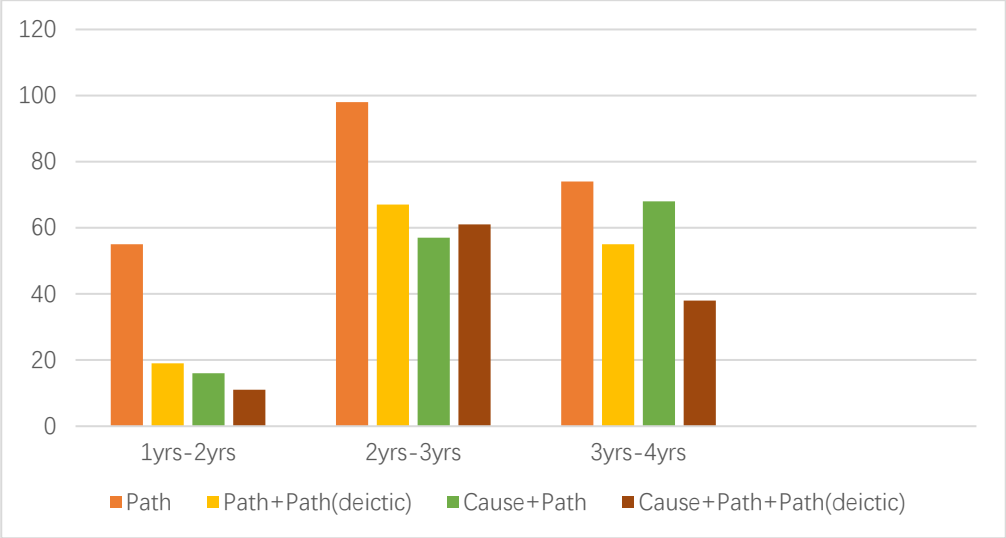


Figure 3. Types of caused motion events constructions

According to the Figure3, it can be analyzed that during the period of 1-2 years old, the magnitude relation between the types of cause verb constructions is as follows: Path>Path+ Path(deictic)>Cause+ Path>Cause+ Path+ Path(deictic). Therefore, during the period of 1-2 years old, it belongs verb framework. During the period of 2-3 years old, the magnitude relation between the types of cause verb constructions is as follows: Path>Path+ Path(deictic)>Cause+ Path+ Path(deictic)>Cause+ Path. Therefore, during the period of 2-3 years old, it belongs verb framework. During the period of 3-4years old, the magnitude relation between the types of cause verb constructions is as follows: Path> Cause+ Path>Path+ Path(deictic)> Cause+ Path+ Path(deictic). Therefore, during the period of 2-3 years old, it belongs verb framework. To sum up, during the period of 1-4years old, the type of caused motion events construction belongs verb framework.

Comparison between Caused and Voluntary Motion Events. The following table5 demonstrates the frequencies (token frequencies and type frequencies) of motion events (including caused motion events and voluntary motion events) in the corpus. Data shows that there are a total of 2571 motion events in the corpus, and 228 kinds of motion events appear in the corpus. Among all the motion events, there is 619 caused motion events, and accounting for 24.08% of the total motion events. During 1 to 2 years of age, 83kinds of motion events occurred, and there is a total of 550 motion events; 35kinds of caused motion events occurred, and there is a total of 101caused motion events. During 2-3 years of age, 164kinds of motion events occurred, and there is a total of 1236 motion events; 86kinds of caused motion events occurred, and there is a total of 283caused motion events. During 3 to 4 years of age, 128kinds of motion events occurred, and there is a total of 785 motion events; 60kinds of caused motion events occurred, and there is a total of 235caused motion events.

Table 5. The token frequencies and type frequencies of caused and voluntary motion events

	1yrs-2yrs	2yrs-3yrs	3yrs-4yrs	Total(1yrs-4yrs)
Motion events (token frequencies)	550	1236	785	2571
Motion events (type frequencies)	83	164	128	
Caused motion events (token frequencies)	101	283	235	619
Caused motion events (type frequencies)	35	86	60	
Voluntary motion events (token frequencies)	449	953	550	

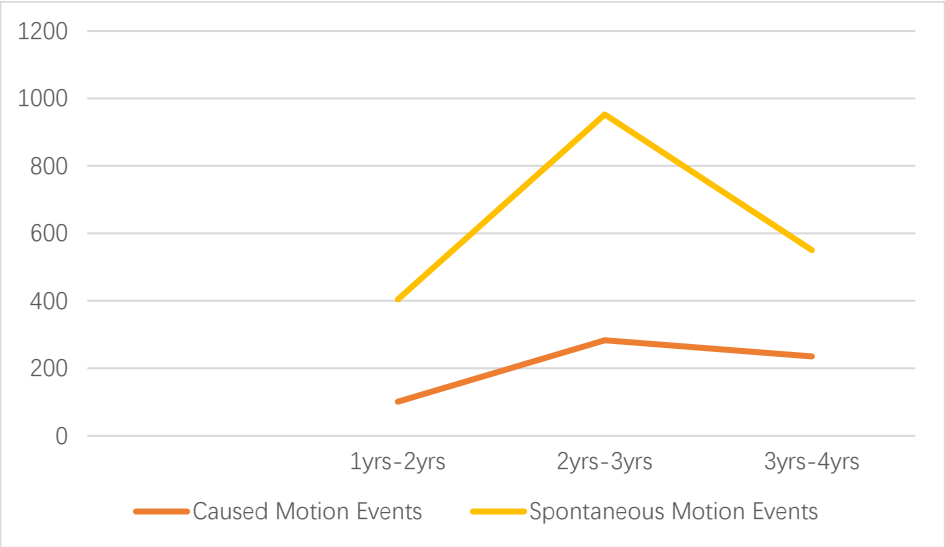


Figure 4. The development of the token frequencies of caused and voluntary motion events

According to figure 4, no matter in quantity or type, the development of voluntary motion events has always been faster than that of caused motion events. Moreover, according to the data analysis, the occurrence time of the first voluntary motion event is (1; 09;11), the occurrence time of the first caused motion event is (1;10;14). Therefore, the occurrence time of the voluntary motion event is earlier than the occurrence time of caused motion event. Therefore, it can be considered that in the development of motion event language expression in 1-4 years old children, the development of voluntary motion events is better.

3. Conclusion

Through examining lexicalization of motion events in the everyday life of SWK (1;00;12-3;11;28), the development process of the caused motion events was investigated. The results of studies on the lexicalization of caused motion events by Chinese children from 13months to 4 months show that:

1) Across age groups, path verbs developed slightly faster than manner verbs at all times. The two kinds of verbs develop most rapidly at the age of 2-3, and reach the peak at the age of 3.

2) And by analyzing development of cause verb constructions, we know that modern Chinese shows the characteristics of satellite-framed language in some aspects. In the data of this thesis, Chinese children tend to use more cause verbs in the expression of caused motion events. The thesis also shows that children's vocabulary develops fastest at the age of 2-3, and reaches its peak at the age of 3. And in the expression of caused motion, the more Path only or Path+ Path used is deictic path verbs. Therefore, the modern Chinese shows the characteristics of verb-framed language in some aspects.

3) Through the analysis of the changes in frequency of motion events, it was found that that the development of voluntary motion event is faster than that of caused motion event. In the early stage of children's language development, the voluntary motion event was first acquired. What is more, the frequency of voluntary motion events is always higher than that of caused motion events. According to children's language cognitive ability, the development of voluntary motion event is faster than that of caused motion event.

This study is based on Talmy's typology theory, and explores the language acquisition process of Chinese children's caused motion events through natural data. Since the information in the corpus only derives from one child, so the data may not be comprehensive. However, it has certain reference value due to the authenticity of the corpus. These conclusions undoubtedly have positive significance for us to further study the language acquisition process of Chinese children's caused motion events through natural data.

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