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Children's Early Production of Physical Action Verbs in Chinese

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Abstract and Keywords

Physical action verbs describe actions involving various parts of the human body. They appear in children's vocabulary starting in the first year of life. This chapter introduces a corpus-based study of the production of physical action verbs of ten Chinese-speaking children between twenty-one and twenty-five months of age. The goals of the study are to find out what types of physical action verbs the children acquired around this age, how they used them in various contexts, and what factors were involved in their domain-specific word learning. The results show that 131 physical action verbs were used by the children and that among the actions depicted by the verbs, twelve different human body parts were involved. It was also found that there was a correlation between the linguistic characteristics of the acquired verbs and the nonlinguistic factors that affect the children's understanding of the effects and the intentions of human actions.

Keywords: word learning, physical action, physical action verb, domain-specific word learning, correlation, linguistic characteristic, nonlinguistic factor, human action

49.1 Introduction

STUDIES of children's early vocabulary show that 70% of their first 100 words are verbs and the remaining 30% consists mostly of names of movable and manipulative objects that can be used when playing with hands or feet (Tomasello 1992; Gao 2001; Ma et al. 2009; Tardif et al. 2009). Also, more than half of the verbs are found to be typical physical action verbs. These findings show that physical action verbs are children's main lexicon in their early years of life. They are the direct linguistic expressions of human physical activities observed or experienced by children in their everyday life. Movable and dynamic aspects of inanimate objects, human physical activities, and children's own physical involvement in action events are all assumed to have contributed to their early understanding and conscious learning of the domain-specific lexical terms. These stimuli for children to learn are ample, dynamic, and available to children at all ages.

Research on child language development addresses the correlation between cognitive development and language development (Gillette et al. 1999; Dapretto and Bjork 2000; Marchman et al. 2004; Snedeker and Gleitman 2004; Fernald et al. 2006). Domain-specific lexical development, such as children's learning of physical action verbs, can be viewed as having a typical feature for such a correlation. This is because when children start to use physical action verbs that describe various body part actions (e.g., *bite*, *kiss*, *shake*, *knock*, *hit*, *kick*, etc.), their understanding of the lexical terms is essentially based on their own physical experience of the actions. Further more their lexical knowledge can be identified as fully acquired conceptual knowledge. The conceptual knowledge in turn supports children's cognitive understanding of the interaction (p. 655) between self and other and between their own world and the world around them. Therefore, the types and the ordering of children's learning of physical action verbs may advance parallel with their experience and understanding of the physical world around them.

Children around two years of age become more active in trying their physical capabilities. Their daily activities are no longer simply children's games. They begin to imitate their parents while joyfully helping them with household chores and attending to adults' activities. The action verbs that depict these activities start to enter into children's vocabulary.

In terms of increase of their vocabulary size, there may not be much difference between children speaking different languages. However, the domain-specific lexical features that reflect the social and cultural contexts in which children are brought up, may affect their understanding of the lexical usage with respect to age and context. It is assumed that there is a correlation between the linguistic characteristics of the physical action verbs that the children acquire and the nonlinguistic factors that affect their understanding of the effects and intentions of the physical actions the verbs describe. The linguistic factors may include the semantic types of physical action verbs, such as the polysemous feature of a physical action verb, the synonymous relations among a group of physical action

verbs, and the language-specific constructions of verb semantics and syntax. The nonlinguistic factors may possibly include children's cognitive abilities in projecting the trajectories of various kinds of event actions and in understanding the causative effect in perceiving actions with motion, force, speed, direction, and so on, their physical capabilities in participating in various physical action events, and the social and cultural environment in which they were learning the language. To find evidence to support the assumption made, this chapter first analyzes ten Chinese-speaking children's production of physical action verbs within a period of six months and then discusses the relationships between the children's domain-specific lexical knowledge and their nonlinguistic knowledge that supports their language development.

49.2 Data Collection

The data extracted from the Beijing corpus under the East Asian Corpora of CHILDES (MacWhinney 2000; Tardif 1993, 1999) were from ten families and their toddlers (eight boys, two girls) recorded in a naturalistic setting. All the infants' parents were native speakers of Chinese living in Beijing. The children's mean age was reported to be 21 months and 24 days at the time of the first recording. Within a six-month period, there were altogether 50 one-hour recordings, with five recordings from each child between one year nine months and three days (1;9.3) and two years three months and two days old (2;3.2). The children's mean utterance length was 1.82 ($SD = 0.60$) morphemes per utterance. (p. 656)

49.3 Data Analysis

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Figure 49.1 Children's production of physical action verbs classified based on body-part involvement

In total, 131 physical action verbs were produced by the children. Most of them were used more than once by more than one child. The appendix only shows first-time occurrences of the verbs produced by any of the ten children.

Categorically the verbs can be divided into verbs

of eye actions, teeth actions, lip actions, mouth actions, shoulder actions, back actions, hand actions, hand actions with a tool, buttock actions, knee actions, foot actions, and

whole-body actions. Altogether twelve different body parts were involved in the actions, with hand actions representing the most and foot actions the second most (See Figure 49.1).

In the first recordings, when the children's mean age was twenty-one months and twenty-four days, they used fifty-six physical action verbs, among which seven kinds of body-part involvement were identified. Of the twenty-three hand-action verbs used, seven of them involved tool uses, such as pencil, scissors, toy shovel, toy gun, and knife. Verbs that describe sophisticated actions and whole-body actions were all used appropriately when communicating with their parents and other adults during different game playing sessions and ordinary daily activities.

In the last recordings, when the children's mean age was twenty-five months and twenty days, they used fifty-two more verbs of sophisticated hand actions, eleven of which were verbs of hand actions with tools (e.g., toothbrush, toy tool, crayon, pencil, rag, broom, fish net, and comb). Verbs of actions that involve specifically lips, a shoulder, and knees were three more kinds of verbs used.

49.3.1 The Acquired Verbs of Actions with Manner Distinctions

Physical action verbs are characterized by encoding manner distinctions in the verb roots. Most of the children's acquired verbs that distinguish action manners can be (p. 657) identified in terms of degrees of force executed, speeds, and motion direction of the actions. With the force distinctions, some of the verbs used indicate that the actions were completed with the force being applied gently (e.g., *pāi, róu, lāo, dié, bǎi, kē, wò, fú*), others with the force being applied to a moderate degree (e.g., *bāi, bān, bāo, chā, pèng, xǐ, rēng, zhuā*), and others still with the force being applied vigorously (e.g., *shuāi, yáo, tuō, lā, zòu, tuī*). The action speed specifying the features of the verbs learned vary from slow (e.g., *tuō, lā, fú, pá*) and moderate (e.g., *gǔn, bāo, bǎng, bāi, shuā*) to fast (e.g., *shuāi, rēng, dǎ, tiào, bèng, tī, dēng, zòu*).

The motion directions of the hand actions include the trajectories of downward, upward, forward, horizontally back and forth, vertically up and down, and sophisticated actions with multidirectional motions, such as *sǎ, shuāi, guà, chā, fàng, yáo, rēng, bá, zhāi*. The Chinese specific verbs with an indication of motion of the feet and action manner of other body parts, such as *bēi, bào, and káng*, were found to have been used by the children in the contexts of asking their parents to carry them or describing their own carrying actions.

Hand actions involving tools are another kind of distinctive manner. The children were found to have learned to express their own hand actions involving tools with the verbs that specify the tools, such as comb (*shū*), scissors (*jiǎn*), knife (*qiē*), crayon (*huà*), toy repair tool (*xīu*), toy shovel (*wā*), spoon (*chī, wèi*), piano (*tàn*), broom (*sǎo*), rope (*bǎng*), and pencil (*xiě*). These learned verbs indicate that the children's conceptualized

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knowledge of the verb meanings is acquired with the support of their own experience of using the tools in the events in which the verbs are generally used.

The foot-action verbs (some traditionally termed “directional verbs”) that specify motion directions used in a “serial verb construction” (Chao 1968; Wang 1973), as shown in the following, were all found to have been used by the children before the age of two. This shows that the children's activities by this age were diverse enough to experience all kinds of motions with directions.

<i>chūlái</i> ‘come out’	<i>jìnlái</i> ‘come in’
<i>chūqù</i> ‘go out’	<i>jìnqù</i> ‘go in’
<i>guòlái</i> ‘come over’	<i>qǐlái</i> ‘get up’
<i>guòqù</i> ‘go over’	<i>shànglái</i> ‘go up’
<i>huílái</i> ‘come back’	<i>shàngqù</i> ‘go up’
<i>huíqù</i> ‘go back’	<i>xiàlái</i> ‘go down’
	<i>xiàqù</i> ‘go down’

49.3.2 More Physical Flexibilities, More Near-Synonymous Action Verbs Acquired

When children were close to two years of age their physical development in strength and flexibility start to allow them to participate in many activities that involve physical actions of various kinds. They can keep their bodies balanced better when walking (p. 658) or running. They have learned how to ride on swings, climb up stairs, and play on the seesaw and slide. Gradually they begin to try using their hands to play with more sophisticated toys such as building blocks and laying puzzles. They also begin to deliberately imitate and learn from adults how to carry out what parents do for them or for the family, such as putting on clothes and shoes, cleaning their faces, opening or closing doors, folding paper toys, cutting paper with scissors, and so on. All these activities involve physical flexibilities and coordination of various body parts. After having imitated enough and experienced the actions, children's perception and cognition for the understanding of human physical actions in relation to linguistic expressions are well achieved and conceptualized. This is the time that children start to produce further types of physical action verbs. Linguistically, categorically distinctive verbs that can be defined as near-synonyms become part of their lexicon. The ones acquired by the children as

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listed in the following are categorically manner-specific, and most of them are distinguished from each other only by subtle differences in the action manners.

Biting:	<i>yǎo, kěn</i>	Kicking:	<i>tī, dēng</i>
Carrying:	<i>bào, káng, bēi, nā, bān</i>	Picking:	<i>tiāo, zhāi</i>
Catching:	<i>jiē, zhuā, lāo</i>	Pouring:	<i>dǎo, chōng</i>
Wearing:	<i>dài, chuān, tà, tuō</i>	Pulling:	<i>tuō, lā, bá</i>
Cutting:	<i>jiǎn, qiē</i>	Putting:	<i>fàng, bǎi, gē, zhān, chā</i>
Drawing:	<i>huà, huà</i>	Rubbing:	<i>cuō, cā, mǒ, rǒu</i>
Hitting:	<i>dǎ, zòu</i>	Scratching:	<i>zhuā, huá</i>
Holding:	<i>wò, ná, niē</i>	Throwing:	<i>shuāi, rēng, sǎ</i>
Jumping:	<i>tiào, bèng</i>	Touching:	<i>pèng, pāi, dòng, tán</i>

Studies in bilingual children's lexical development and adult language learning state that one of the challenges in word learning is the learning of near-synonyms and that the ability in choosing an appropriate word among several and using it in the right context can be regarded as an indicator that the learner is at a higher level of learning (Gao and Ouyang 2009; Gao and Wang 2012). Thus the findings in this study suggests that the children were at a peak of lexical development and that there was a strong correlation between the speed of gaining language competence and the learning environment. Moreover, the different types of the acquired near-synonyms may also reveal more about how nonlinguistic knowledge gained by the children in daily activities supports particular aspects of child language learning. After all, the learning of physical action verbs is not the simple learning of lexical words per se.

49.3.3 Senses, Interpretations, and Intentions

In all the recordings, the adults' utterances to their children transmitting the same messages were found to be repeatedly rephrased as the adults were trying to elicit more word productions from their children. The adults' repetition of the action verbs was often (p. 659) accompanied by their own physical demonstrations of the actions as well as their verbal descriptions of the causal effects of the actions, such as people's feelings of pain and happiness, etc. This feedback played an important role in helping the children

connect their physical experiences to the meanings of the verbs and at the same time learn to infer, for instance, in what situation and to what persons certain actions are proper or not.

With regard to the relation between the children's physical activities and the learning of word senses, *dǎ* used by the children is a typical example of how they acquired lexical meanings in their daily activities. *Dǎ* is a polysemous verb with its senses extended far beyond its prototypical meaning of hitting with a bare hand. The children's uses of the verb fall into seven different semantic categories that can be specified as hitting a ball in game playing (e.g., *dǎqíu*); hitting actions performed with tools (e.g., *dǎqì*, *dǎ diànhuà*, *dǎ zhēn*); destroying something by hitting (e.g., *dǎ sǐ*); and hitting someone to give physical pain (e.g., *dǎ téng*), to show a strong dislike (e.g., *dǎ gugu*), to give a physical attack in self-defense (e.g., *dǎ nǐ*), and to give physical punishment (e.g., *dǎ pìpì*, *dǎ pìgu*, *āidǎ*, *yào dǎ*, *dǎ nǐ*).

Among the seven senses of *dǎ* used by the children, the sense of giving physical punishment was used by most of them (seven out of ten) in the first-time recordings and by all ten children in the rest of the recordings. Its frequency was the highest of all. The different senses, various interpretations, and highly frequent uses of such a single verb acquired by the children at this young age indicate that they understand well physical action intentions as well as the socially expected interpretations of the responses. Besides, parents' verbal and physical behaviors influence their children's learning of lexical meanings.

49.4 Discussion

The findings of this study support the hypotheses that there is a correlation between the Chinese domain-specific verbs that the children learn and the nonlinguistic factors that affect the children's understanding of the effects and intentions of physical actions. The semantic types of the physical action verbs that the children used include the top-ranked polysemous verb *dǎ* 'hit/beat', whose seven different senses were used by them in various contexts. Eighteen pairs or groups of physical action verbs were found and identified as near-synonyms. Syntactically, the Chinese-specific serial verb constructions were common in the children's uses of the physical action verbs to specify motion directions and causative action results.

The nonlinguistic factors include the children's physical capabilities in participating in the physical activities that involve actions of various body parts; their cognitive abilities in perceiving action manners and causal effects, such as degrees of force, motion, speed, motion direction, and so on; and their social and cultural understandings of the implications and intentions of the verbs used in different contexts. The physical experiences by which the children came to know what a physical action verb depicts and what (p. 660) causal effect it may have seemed to be part of the preconditions for their

learning of physical action verbs. In other words, children's cognitive understanding of the physical action verbs and their physical capability in participating in the action events help them learn the corresponding lexical terms. Besides, the number of the verbs and the ordering of the senses acquired seem to suggest that their physical and cognitive developments are parallel to their social and cultural developments.

Cross-linguistic studies provide evidence of children's ability to learn about particular actions and to structure the action categories (Slobin 1981; Chang and Maia 2001; Piaget 2002). Such extralinguistic knowledge can facilitate children's lexical categorization of new words. For instance, the verbs acquired by the children can be categorically defined both in terms of the types of body-part involvement and the linguistic features of the verbs. The types and features are also correlated with the learning order, the action manners, and the types of the children's daily activities; the more specifically the verb refers to an action that involves a single part of the body and that is common in children's daily activities, the higher tendency that children learn its sense first. This accords with the findings of other recent studies on children's lexical development (Maouene et al. 2011; Gao and Wang 2012).

In relation to manner distinctions, other studies reported that words that are manner-specific in meaning tend to be more easily acquired (Imai et al. 2002, 2005; Buresh et al. 2006; Tardif 2006; Pulverman et al. 2006; Chan et al. 2011) and words that are highly imaginable were found easy for children to learn (Ma et al. 2009; McDonough et al. 2011; Wang and Gao 2012). Possibly for similar reasons, the children in this study were found to have learned most of the commonly used physical action verbs that are both manner-specific and manner-imaginable. Moreover, they used the verbs not only to express the manner-distinctive actions but also how the effects they felt.

The social and cultural environment influences children's development in general. This study shows that the children's learning order of the verb senses was particularly influenced. The fact that 90% of the verb *dǎ* used by children means physical punishment is a good example. One may ask the question: Why do Chinese-speaking children learn this particular sense of *dǎ* at such an early age? First, we need to know that *dǎ* is the simplified term of *dǎ pìgu* 'spank', which is often used by Chinese parents on their children. The utterance of *dǎ pìgu* is generally merely a warning to their misbehaving children, though real spanking may not follow the verbal warning, as was the case found in quite a number of parents' utterances in this study: "Spare the rod and spoil the child." Culture may be defined as what a society does and thinks (Sapir 1921; cf. Lee 1996). The view that children will flourish only if disciplined and that physical punishment for any wrongdoing is necessary seems to be rooted in Chinese parents' thinking. As a self-defense and an imitation of parents' behavior, children learn the meaning of the verb with a clear understanding of its implications.

From the sociolinguistic perspective, the children's usage of *dǎ* support the assumption that children's conceptualization of word senses for the learning of physical action verbs are based on their cognitive understanding of human physical actions as well as the

implications of human actions in a social context. They are both good indicators of (p. 661) people's norms in a society. A good case in point is Gao's (2001) comparative study of the Swedish children's uses of the Swedish verb *slå* 'beat' and the Chinese children's uses of its Chinese equivalent verb *dǎ*. A striking difference found was that the Swedish children used *slå* only to refer to accidental actions with an inanimate agent as the subject (e.g., "the ball hit me"), while the Chinese children at about the same age used *dǎ* only to mean human intentional actions mainly for physical punishment. According to the UN Committee on the Rights of the Child, physical punishment of children was officially banned in China in 1949, almost ten years earlier than in Sweden (1958). Yet the use of the verb as a verbal reference to the physical punishment in Sweden has disappeared while the practice in China has obviously been going on to the present day. This shows that children's language is a reflection of the social and cultural environment they live in, and the trajectory of language development is shaped by both linguistic and extralinguistic environments (Tomasello 2003; Gao and Zelazo 2008).

In sum, the study introduced in this chapter shows that the Chinese-speaking children around two years of age were learning and using physical action verbs actively. Their production reveals interesting characteristics of domain-specific lexical development and their acquisition of the various kinds of extralinguistic knowledge. The findings can contribute to the future studies of children's language development in relation to their cognitive, social, and cultural developments.

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Appendix

Chinese-Speaking Children's Production of Physical Action Verbs

(p. 662)

(p. 663)

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Children's Production	Age	Children's Production	Age
	1;9.3		2;1.4
看 kàn 'look'		挤 jǐ 'squeeze'	
咬 yǎo 'bite'		剥 bāo 'peel'	
吃 chī 'eat'		撒 sā 'drop'	
叫 jiào 'call'		动 dòng 'touch'	
打 dǎ 'spank'		刷 shuā 'brush (teeth)'	
打 dǎ 'hit/beat'		上去 shàngqū 'go up'	
去 qù 'go'		上来 shànglái 'go up'	
来 lái 'come'			2;1.9
跑 pǎo 'run'		笑 xiào 'smile'	
走 zǒu 'walk'		亲 qīn 'kiss'	
跳 tiào 'jump'		搥 kē 'knock'	
	1;9.6	弹 (琴) tān(qín) 'play the piano'	
唱 chàng 'sing'		穿 chuān 'put on'	
戴 dài 'put on'		推 tuī 'push'	
盖 (被) gài(bèi) 'cover'		抓 zhuā 'scratch'	
接住 jiēzhù 'catch (a ball)'		贴上 tiēshàng 'stick on'	
剪 jiǎn 'cut (with scissors)'		脱 tuō 'take off (shoes)'	
打 dǎ 'hit (badminton)'		拧 nǐng 'tweak'	
发 fā 'serve a ball'		碰 pèng 'bump'	

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撮 cuō 'gather up'	拖 tuō 'drag'
回去 huíqù 'go back'	挖 wā 'scoop'
开走 kāi zǒu 'drive away'	打开 dǎkāi 'open (door)'
滚 gǔn 'roll on the ground'	绑 bǎng 'tie up'
起来 qǐlái 'get up'	抹 mǒ 'apply cream to hand(s)'
1;9.10	画 huà 'draw'
插 chā 'stick in, insert'	修车 xiūche 'repair (a toy car)'
放 fàng 'put'	撞 zhuàng 'bump'
坐 zuò 'sit'	动 dòng 'move'
踢 tī 'kick'	过来 guòlái 'come over'
跳舞 tàowǔ 'dance'	进去 jìnqù 'go in'
躺 tǎng 'lie'	挂 guà 'hang up'
摇 yáo 'shake'	捏 niē 'pinch'
关门 guān 'close (door)'	洗 xǐ 'wash'
拿 ná 'take'	打 dǎ 'make a phone call'
1;9.21	翻 fān 'turn (book pages)'
背 bēi 'carry on the back'	扫 sǎo 'sweep'
蹬 dēng 'kick'	放 fàng 'fire crackers'
摔 shuāi 'fall'	打 dǎ 'pump (a toy bicycle tire)'
1;9.25	站 zhàn 'stand'
喂 wèi 'feed'	2;1.18

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扔 rēng 'throw'	冲 chōng 'pour (water to drink)'
拍 pāi 'pat'	爬 pá 'crawl'
蹦 bèng 'jump'	2;1.20
倒 dǎo 'fall'	粘 zhan 'stick to'
1;9.27	划 huà 'scratch'
哭 kū 'cry'	擦 cā 'wipe'
下来 xiàlái 'go down'	打 dǎ 'fire a toy gun'
踩 cǎi 'step on'	回来 huílái 'come back'
1;10.12	2;2.18
喝 hē 'drink'	掰 bāi 'break up'
包 bāo 'wrap'	抓 zhuā 'catch'
趴 pā 'crawl'	摔 (坏) shuāi(huài) 'toss, cast'
搁 gē 'put'	揉 róu 'massage'
揍 zòu 'spank'	摘 zhāi 'take off'
搬 bān 'move'	握 wò 'shake hand'
切 qiē 'cut (with a knife)'	捞 lāo 'fish for'
1;10.20	打 dǎ 'give an injection'
写 xiě 'write'	过去 guòqù 'go over'
骑 qí 'ride'	冲杀 chōngshā 'run ahead'
下去 xiàqù 'go down'	靠 kào 'lean against'
出去 chūqù 'go out'	2;2.7

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出来 chūlái 'go out'	抽 (烟) chōu(yān) 'smoke'
2;0.27	套上 tàoshàng 'put on'
嚼 jiáo 'chew'	梳 shū 'comb'
拿来 nálái 'bring'	啃 kěn 'gnaw'
倒 dào 'pour'	2;3.2
摆 bǎi 'place'	扛 káng 'carry on the shoulder'
挑 tiāo 'select'	叠 dié 'fold'
蹲 dūn 'crouch'	拔 bá 'pull'
到 dào 'go'	扶 fú 'support with the hand(s)'
进 jìn 'go in'	抱 bào 'carry in the arms'
进来 jìnlái 'come in'	拉 lā 'drag'
	过 guò 'cross'

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