

Decoding Chinese Frequency Adverbs in Language Socialization: The Role of Typicality and Contextual Cues

Yu-cheng Elisa Cheng
National Taiwan Normal University

Chun-yin Doris Chen
National Taiwan Normal University

Asian Linguistic Anthropology
2023, 5(3): 1-27
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DOI: 10.47298/jala.v5-i3-a1
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Abstract

In this study, we investigate children’s interpretation of Chinese frequency adverbs during various points in their language socialization. We conducted the study in two phases. In Phase 1, we obtained interpretations of frequency adverbs using an identification task and an ordering task. In Phase 2, we examined children’s acceptance of various event types using an acceptability task.

A total of eighty children were recruited and divided into four groups according to their grades. Twenty adults were also recruited as a control group. The results indicated that interpreting “typical” frequency adverbs such as *zongshi* ‘always’ and *congbu* ‘never’ was more challenging than interpreting “atypical” adverbs. In addition, we found that contextual clues had a negative effect on the subjects’ interpretation of frequency adverbs. Child subjects generally gave lower acceptability ratings to tasks with context provided than to context-free tasks.

Keywords: *Frequency adverbs, context, language socialization, Taiwan Mandarin, ethnography*

Introduction

Frequency, according to *Xiandai Hanyu Cidian* (the Contemporary Chinese Dictionary), is the number of times a particular event occurs in a set period of time. Zou (2006) defines frequency adverbs as those adverbs that express the number of times an event or an action occurs within a particular period of time. The term ‘frequency adverb’ is generally defined as an adverb that denotes the respective or approximate number of times an event or an action occur within a period of time, that is, the frequency of occurrence of the adverb.

Frequency adverbs are indispensable for communication in many languages. One such case is Mandarin (Li 2010). Mandarin speakers employ frequency adverbs to express their intentionalities (Duranti 2014), and hence the frequency with which an event has occurred, occurs, or will occur (Biber et al. 2000). Consequently, and in reaction to this, interlocutors can know the frequency of occurrence of that event. Children, however, have difficulty in interpreting or appropriating frequency adverbs, as noted in several studies (e.g., Huang and Huang 2011). Kuczaj (1975) found that among a sample of forty preschoolers, only nine were able to recognize the frequency adverb ‘always’ as having a strong positive connotation, and also the frequency adverb ‘never’ as having a strong negative connotation.¹ Only a small percentage of the people in the sample set believed that these two frequency adverbs exhibited both positive and both negative connotation.

Previous studies on the Chinese context classify frequency adverbs into five levels or types (Wu and Ding 2005), according to the respective frequencies that they denote. Piao (2011), however, classifies Chinese frequency adverbs into three levels: The highest level includes *zong(shi)* ‘always,’ *lao(shi)* ‘always,’ and so on; the next lower level includes *chang* ‘often,’ *jingchang* ‘often,’ *changchang* ‘usually,’ and so on; the lowest level includes *youshi* ‘sometimes,’ *ouer* ‘occasionally,’ and the like. In terms of quantity, frequency adverbs at the highest level are permanent, those of the lower level imply fewer recurrences, and the others signify an ‘in between.’ Piao (2011) also argues that frequency adverbs mainly appear either before the subject or between the subject and the predicate, where the latter is more typical. Sentences with frequency adverbs prior to the subject are marked and can be repositioned to between the subject and the predicate. This sentence functions, in part, to highlight the importance of frequency, and to link any preceding context.

However, the available studies frequently fail to distinguish among frequency adverbs that denote low levels of frequency (i.e., *henshao* ‘seldom,’ *jihubu* ‘rarely,’ and *congbu*² ‘never’). Both *jihubu* ‘rarely’ and *congbu* ‘never’ include the suffixed negative element *bu*, yet children are not always able to distinguish these. Limited scholarly work has addressed such frequency adverbs, thus creating a void in the literature.

The present study will address this void, and will expand the system of five types of Chinese frequency adverbs to a system of seven types, to explore the influence of social contexts on the difficulty in interpreting typical and atypical frequency adverbs. As such, to develop the study, we will address the following two questions:

1. Do typical and atypical frequency adverbs in Mandarin display a commensurate degree of comprehension difficulty, and hence, do they both contribute to a similar order of language socialization?
2. Do contextual clues prompt Chinese children to interpret events that contain frequency adverbs during their language socialization?

To respond to these questions, we structure this paper as follows: In the second part, the Literature Review, we present a review of the literature up to the present time, and discuss this literature in its discursive and social contexts. In the third section, Research Design, we describe our methodical framework as a combined qualitative and quantitative approach, and discuss the optimal use of such a framework for our study. In the fourth section, we discuss the data and its analysis. In the fifth section, we conclude the paper and propose potential avenues for future research.

Literature Review

In this section, we explore several models through which researchers and theorists categorize frequency and frequency adverbs. We discuss the ambiguity inherent in the use of frequency adverbs, as critical for capturing subtle nuances in communication. While the models are not directly relevant to our data and analysis, they provide a more holistic description and understanding of the use of frequency adverbs, which is our initial intention, that is, to provide a description of the boarder environment, within which, frequency adverbs appear. Following this, we shift our focus more centrally to our use of frequency adverbs, uncovering their roles as temporal cues in language socialization processes. Through an attention to empirical work, we elaborate on the intricate interplay between language, socialization, and context.

Empirical Studies on Vague Linguistic Terms

In modern standard Mandarin Chinese, frequency can be expressed using short terms (e.g., *fenfen miaomiao* 'every minute and every second'), adjectives (e.g., *qin* 'often'), and adverbs (e.g., *zongshi* 'always,' *changchang* 'usually,' and *youshi* 'sometimes'). Of these three frequency sets of expressions, Wu and Ding (2005) find that short terms and adjectives denoting frequency are a limited set, while adverbs constitute the main type of frequency expressions.

In Mandarin, as well as in other languages, frequency adverbs carry three semantic features: Diffuseness, vagueness, and quantifiability. Diffuseness contrasts with continuity, where frequency adverbs indicate an event or an action that is not always so. For instance, the word *changchang* ('usually') is a frequency adverb while *yizhi* ('all the time') is a temporal adverb which possesses the feature of continuity and thus, may not be a frequency adverb. Vagueness, sometimes termed indefiniteness, has the semantic property as non-specificity. For instance, the word *changchang* ('usually') indicates that an event or an action occurs 'many' times, but does not specify 'how many' times it occurs. Quantifiability suggests that frequency adverbs can be ranked in terms of quantity. For instance, the word *changchang* ('usually') is ranked higher than the term *ouer* ('occasionally').

Wu and Ding devise a formula to distinguish frequency adverbs, containing X/Y as the frequency adverb, S as the subject, V1 as the verb phrase, and V2 (and so forth) as another verb phrase.

Formula	SXV1XV2
1.a Description	X/Y (frequency adverb) (<i>youshi</i> 'sometimes'), S (subject) (<i>ta</i> 'he'), V1 (verb phrase) (<i>zai jia</i> 'at home'), V2 (verb phrase) (<i>zai xuexiao</i> 'at school').
Chinese	Ta jingchang zai jia, ouer zai xuexiao.
English	He is often at home and is occasionally at school.
1.b Formula	SYV1ZV2
Description	X/Y (frequency adverb) (<i>youshi</i> 'sometimes'), S (subject) (<i>ta</i> 'he'), V1 (verb phrase) (<i>zai jia</i> 'at home'), V2 (verb phrase) (<i>zai xuexiao</i> 'at school').
Chinese	Ta congbu zai jia, yizhi zai xuexiao.
English	He is never at home and is always at school.
1.c Formula	SXV1YV2
Description	Here, X/Y is the frequency adverb (<i>congbu</i> 'never' / <i>yizhi</i> 'always'), V1 (verb phrase) (<i>zai jia</i> 'at home'), V2 (verb phrase) (<i>zai xuexiao</i> 'at school')
Example Set 1	

The authors apply the above formulae to classify frequency adverbs into five levels (Table 1 below).

Frequency	Examples
the highest level	<i>zongshi</i> 'always'
the higher level	<i>changchang</i> 'usually'
the middle level	<i>youshi</i> 'sometimes'
the lower level	<i>ouer</i> 'occasionally'
the lowest level	<i>congwei</i> 'never'

Table 1: Wu and Ding's (2005) five levels of frequency adverbs (Wu and Ding 2005, p. 21)

Despite the fact that many verbs do become modified by frequency adverbs, this process does not affect all verbs. Such restrictions on the use of frequency adverbs may problematize the language socialization of children. Here, for example, Zou (2007) argues that frequency adverbs have the semantic feature [+diffuseness], so that events that can be modified by frequency adverbs must be in some way bounded. Below, in Example Set 2, we present the contrast between those events that can be modified by frequency adverbs and those that cannot.

	Chinese	Ta	changchang	da	ren.
2.a	English	he	usually	hit	people
	English	'He usually hits people.'			(Huang and Huang 2011, p. 78)
	Chinese	?Ta	changchang	renshi	Wang xiansheng.
2.b	English	he	usually	know	Wang Mr.
	English	'?He usually knows Mr. Wang.'			(Huang and Huang 2011, p. 78)
Example Set 2					

It is acceptable to modify *da ren* ('to hit people') with *changchang* ('usually') (Example 2a), but unacceptable to modify *renshi Wang xiansheng* ('to know Mr. Wang') with *changchang* (usually) (Example 2b), which we have found repeatedly in our ethnographic studies of the region.

Zou (2006) describes the division of frequency adverbs as two types, according to use; judgmental types (Type A), which judge the frequency of an event and identify a focus when accompanied by *shi* (be), and description types (Type B), which describe the frequency of an event. Zou then divides these Types A and B into subtypes, as we present in Figure 1 (below).

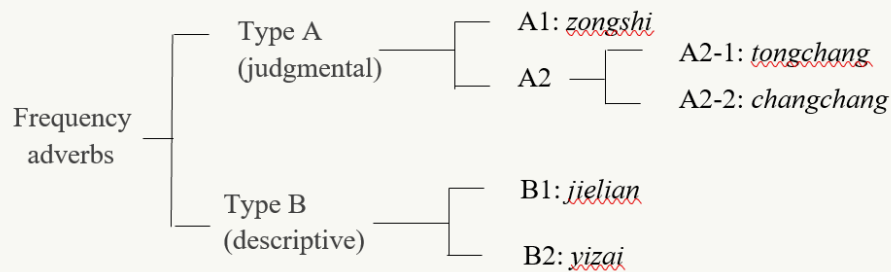


Figure 1: Zou's (2006) classification of the subtypes of frequency adverbs

Type A frequency adverbs differ from Type B frequency adverbs in two ways: First, the frequency adverbs of Type A can be negated, while those of Type B cannot (e.g., *bu changchang* (not usually) vs. **bu lu* (not repeatedly)). Second, when Type A and Type B adverbs co-occur in a sentence, Type A must precede Type B. Descriptive frequency adverbs (i.e., Type B) directly describe the frequency of an action, and hence significantly strengthen the relationship between a descriptive frequency adverb and a verb in a sentence. Oppositely, judgmental frequency adverbs (i.e., Type A) indicate the frequency of an action. The relationship between a judgmental frequency adverb and a verb is weaker than that of the relationship between a descriptive frequency adverb and a verb. Frequency adverbs of both Type A and Type B can be further subdivided: The frequency adverbs of Type A can become two subdivisions; Type A1 and Type A2, contingent on their ability to express the duration of an event or action. According to Zou (2006), only Type A2 and Type B2 frequency adverbs can become typical frequency adverbs. Type A1 frequency adverbs cannot appear in the focus position, a mechanism which differs from the general tendency of placing frequency adverbs in the focus position. As such, frequency adverbs of this type are atypical. Similarly, Type B1 frequency adverbs exhibit the semantic features of recurrence and duration, and thus also belong to the atypical category. Type A2 frequency adverbs also subdivide into two categories; Type A2-1 and Type A2-2: While Type A2-1 frequency adverbs can be placed in a focus position, they retain the semantic features of recurrence and duration, which are not typical features of frequency adverbs. Overall, the distinctions between and among the various subtypes of frequency adverbs can provide insights into their use and semantic appropriation across contexts.

Frequency Adverbs During Language Socialization

While this paper primarily focuses on frequency adverbs, we have also included discussions of non-frequency verbs in the literature in this section, as they assist in the description of a more holistic environment with regards to frequency adverbs, and in the description of vagueness. Exploring the semantic contexts and limitations of a larger set of verbal probability expressions can provide valuable insights into our investigation of the acquisition of frequency adverbs.

Kuczaj (1975) studied language socialization incorporating frequency terms, by investigating five terms denoting varying degrees of frequency. Kuczaj conducted two experiments, including each of the two following sample sets: Forty preschoolers, aged from 40 to 56 months, participated in Experiment 1 and thirty-two preschoolers, aged from 42 to 61 months old, took part in Experiment 2. In Experiment 1, the strategists examined the extent to which the takers understood the two extremes of frequency, always and never, as a positive-negative binary. The task consisted of sentence pairs that included always, never, or a VP only, requiring takers to respond to 'Who VPs?' after hearing each sentence pair. The results suggest that sentences containing the frequency verb never were answered correctly more frequently than always sentences, yet the difference was not statistically significant. Moreover, half of the takers understood the frequency adverb always as positive, and the frequency adverb never as negative. However, the takers did not understand the two as strong positive or strong negative respectively. The sentences in Experiment 2 included not only the frequency adverb always and the frequency adverb never, but also the frequency adverbs usually, seldom, and sometimes. The results of Experiment 2 suggest that the correct response rate for the sentences containing the frequency adverb never was the highest among correct rates for the five terms. In addition to this, some subjects correctly interpreted the frequency adverbs always and never but rendered the frequency adverbs sometimes as nonsense. The data therefore failed to support the hypothesis proposed by Martin Braine, which predicted that the frequency adverb sometimes would be acquired before always and never during processes of language socialization.

Beyth-Marom (1982) attempted to demonstrate the semantic environments and inhibitions of verbal probability expressions in a professional forecasting organization in Israel. The study included an isolation section and a context section, where the subjects were all experts in political forecasting. Here, twenty-seven takers took the isolation part, and thirty-two takers took the context section. The isolation section contained thirty Hebrew verbal probability expressions, requiring the takers to complete five tasks (a numerical translation task, an event-classification task, a probability-expression classification task, a matching task, and a second numerical translation task). The results suggest that the takers were highly consistent in the numerical translation task and the second numerical translation task. The context section contained a questionnaire with fifteen selected paragraphs, each containing lexical items

expressing the probability that an event would happen. The takers were asked to indicate their thoughts on the probability of the events from 0 to 100. The takers were also highly consistent in the context section. With regard to between-subject consistency, the subjects' judgments varied to a higher degree when a probability expression appeared in context rather than in isolation.

To examine children's semantic placement and appropriation of three terms each denoting one of three degrees of likelihood, that is, possibly, probably, and definitely, Hoffner et al. (1990) conducted two studies with seventy-eight child takers, to monitor the socialization of these takers into the use of the terms. In Study 1, the group examined the children's semantic appropriation of the three terms, where the takers listened to narratives on two people who were likely to perform an activity, and were then asked to predict which of the two was more likely to perform the activity. The results expose significant differences in the semantic groupings and placements of the terms, by children at a variety of ages and grade levels, and through a variety of word combinations. Performance accuracy correlated with the rise in grade level, and takers had a greater accuracy when distinguishing between the term definitely and each of the other two terms (i.e., definitely and possibly, definitely and probably) than they did when distinguishing between the terms possibly and probably. In Study 2, however, the takers were given a narrative on three children who watched a frightening full-length movie. Following, the takers listened to a statement on each of the three children, and one that described the child's perception of the imminent and hence unavoidable arrival of the frightening event. Each statement contained only one of the three terms, requiring the takers to rate the probability of fright from 1 ('not scared at all') to 7 ('very, very scared'). The results evidenced the appearance of variations, the significance of which was predicated on both the form of the statements and the takers' grade levels. Here, the takers perceived the children as more frightened at times when the statements described the likelihood that a scary event would occur than when statements described the likelihood that a scary event would not occur. The analysis also exposed an interaction between the form of the statements and the three terms, suggesting that the greater the likelihood of a frightening event, the greater the experience of the freight, while the greater the likelihood a frightening event will not happen, the less frightened someone would feel.

Huang and Huang (2011) analyzed the semantic appropriation of frequency adverbs. The researchers recorded the spoken interactions of takers aged one to five and classified the occurrence of frequency adverbs into three levels; high-value, medium-value, and low-value (cf. Shi 2002).³ Overall, the study found that the number of frequency adverbs used by those below the age of five was small. They note that the high-value frequency adverb, *lao* ('always') was uttered first (2;6), followed by the low-value frequency adverb, *youshihou* ('sometimes') (3;6). It was not until the age of four that children began to utter medium-value frequency adverbs, such as *changchang* ('usually') or *jingchang* ('often'). In principle, stage in life of uttering the

frequency adverbs correlated with frequency of use of these adverbs. Therefore, we infer that children did more often employ high-value frequency adverbs. Generally speaking, the researchers found that children tended to develop a semantic repertoire around the outermost expressions prior to developing a semantic repertoire around the inner members (Hoffner et al. 1990; Huang and Huang 2011; Kuczaj 1975). The fact that the semantics of the outermost expressions are more precise than those of the innermost expressions may have contributed to the occurrence of this phenomenon (Bocklisch et al. 2012). Furthermore, the fact that the innermost members outnumber the outermost members may also have contributed to the phenomenon (Beyth-Marom 1982). Children may experience difficulty in developing a semantic field around the degrees of the inner members, owing to the larger number of inner members. Moreover, by grade five, most children had developed a strong semantic repertoire around the ranking of degrees of words denoting frequency or probability (Huang and Huang 2011; Hoffner et al. 1990.). In addition, Beyth-Marom found that the takers' judgments were more consistent without context, and contextual clues interrupted takers' judgments.

Noting the limitations of these studies, the semantic interests of both researchers and takers were somewhat vague in terms of probability or frequency, while their research designs varied quite significantly. The ages of the takes varied considerably; those in the study by Beyth-Marom (1982) were adults, while those of Kuczaj (1975), Hoffner et al. (1990), and Huang and Huang (2011), were children. Moreover, the three studies on children's semantic building did not compare the results of the experimental groups with those of the control group. The tasks across the four studies also varied significantly. Kuczaj (1975) designed comprehension, judgment, and imitation tasks, Beyth-Marom (1982) and Hoffner et al. (1990) employed judgment tasks to elicit subjects' understanding of expressions, and Huang and Huang (2011) did not design tasks, but rather, relied on a corpus to collect data. Finally, the number of expressions addressed by these studies also varied significantly.

Methodical Framework

The individuals in the sample sets in the above studies ranged from one to eleven years of age. Kuczaj (1975), Hoffner et al. (1990), and Huang and Huang (2011), for example, populated their sample sets with individuals under five years of age. However, the studies suggested that the sample set, through their then current language socializations, had not extensively developed strong semantic fields in connection to the lexical items.

As the individuals had not significantly developed semantic repertoires for these lexical sets at their current stage in language socialization, we developed a sample set between six and twelve years of age, in order to observe developmental socialization from this point and upwards. By selecting this age group, we have sought to determine if individuals at this age are socialized to the point where they can interpret frequency adverbs in any way similar to adults.

We collated a sample of eighty Taiwanese children studying in a kindergarten and an elementary school in Taipei. These individuals exhibited no speaking, hearing, nor developmental impediments. We divided the sample into four groups, each consisting of twenty children, according to their year levels (kindergarten, grade 2, grade 4, and grade 6). In addition, we selected and placed twenty adults into a control group. The sample set designs intended to allow for a lens through which to observe the language socialization of these students in terms of frequency adverbs.

Despite previous classifications of Chinese frequency adverbs into three levels (Piao 2011) or five levels (Wu and Ding 2005), these classifications omit the two frequency adverbs *henshao* ('seldom') and *jihubu* ('rarely'). According to Zheng (2011), these two frequency adverbs are not close in meaning, where *henshao* appears more frequently than does *jihubu*. We therefore propose a seven-level categorization, as a framework through which to frame the sequence of socialization of frequency adverbs in this study, as we present in Table 2 (below).

Wu and Ding (2005)	Revised Level	Examples	Type
the highest level	Level 1	<i>zongshi</i> 'always'	Atypical
the higher level	Level 2	<i>changchang</i> 'usually'	Typical
the middle level	Level 3	<i>youshihou</i> 'sometimes'	
the lower level	Level 4	<i>ouer</i> 'occasionally'	
N/A	Level 5	<i>henshao</i> 'seldom'	
N/A	Level 6	<i>jihubu</i> 'rarely'	
the lowest level	Level 7	<i>congbu</i> ⁴ 'never'	Atypical

Table 2: A revised classification of frequency adverbs

Describing Categories

To begin to contextualize frequency adverbs, we note one binary categorization of events; Type 1 events (ET1) as telic, and Type 2 events (ET2) as atelic. Frequency adverbs can only modify ET1, a category of events which consists of telic verbs (Garey 1957; Zou 2007), and denoting boundedness verbs such as accomplishment and achievement (Vendler 1957). Here, the literature identifies three telicity-related constructions—resultative (ET1-1) (as in Example 3a), verb-particle (ET1-2) (as in Example 3b) and dative/double object (ET1-3) constructions (as in Example 3c) (Hoekstra 1988; Kayne 1985; Snyder 1995).

	Chinese	Ta	changchang	da	po	beizi.		
3.a	English	he	usually	hit	broken	cup		
			'He usually breaks a cup into pieces.'					
	Chinese	Baba	changchang	xiang	chu	banfu,	xiang chenggong	jieyan.
3.b	English	father	usually	think	out	solution	want successfully	give up smoking
			'Father usually comes up with a solution to give up smoking.'					
	Chinese	Wo	changchang	song	hua	gei	ta. ⁵	
3.c	English	I	usually	give	flowers	GEI	him	
			'I usually give flowers to him.'					
Example Set 3								

The ET1-1 category emerges through the formation of a resultative verb compound (RVC) or a resultative V-de construction⁶ (Huang 1992; Jaxontov 1988; Li 1990; Lin 2004; Tai 2003; Xiao and McEnery 2004; Zhang 2001). In the ET1-2 category, as a verb particle construction, directional verbs (e.g., *shang* ('to ascend'), *xia* ('to descend'), *qi* ('to arise'), and *chu* ('to emerge')), and resultative verbs (e.g., *diao* ('to fall'), *zou* ('to leave'), *dao* ('to reach'), and *kai* ('to open')), are all regarded as particles (Chen 2003). The formations in the ET1-3 category become a dative/double object construction.

Objects in the ET2 category are atelic events which cannot occur with frequency adverbs, owing to the fact that the category exhibits unboundedness, as in Example 4a-1 and Example 4b-1. However, according to Zou (2007), some atelic verbs, also known as unbounded verbs, can be modified by frequency adverbs once an endpoint is added to the external structure. Thus, we can classify ET2 into two subcategories: ET2-1, which accepts temporality externally as in Example 4a-2, and ET2-2, which rejects temporality externally, as in Example 4b-2.

In Example 4a, *xiang* is atelic, and hence, its unboundedness emanates from an unacceptability of the context in Example 4a-1. However, with the addition of *qunian* ('last year') externally to the predicate, denoting the completion of the event, *xiang* becomes telic and diffused, rendering Example 4a-2 as acceptable. On the contrary, ET2-2 verbs, such as *renshi* ('to know'), as in Example 4b, cannot be modified by frequency adverbs in all circumstances (as in Example 4b-1 and Example 4b-2), owing to an unboundedness.

4.a	1	Chinese	Ta	ouer	xiang	pohuai	womende	youqing.
		English	he	occasionally	think	destroy	our	friendship
		'He occasionally thinks about destroying our friendship.'						
	2	Chinese	Ta	qunian	ouer	xiang	pohuai	womende
	English	he	last.year	occasionally	think	destroy	our	friendship
	'He occasionally thought about destroying our friendship last year.'							
4.b	1	Chinese	Ta	ouer	renshi	Wang	xiansheng.	
		English	he	occasionally	know	Wang	Mr.	
		'He occasionally knew Mr. Wang.'						
	2	Chinese	Ta	qunian	ouer	renshi	Wang	xiansheng.
	English	he	last.year	occasionally	know	Wang	Mr.	
	'He occasionally knew Mr. Wang last year.'							
Example Set 4								

Throughout, we can distinguish five event types, according to their possibility of co-occurring with frequency adverbs, as we present in Table 3 (below).

Type	Prediction of Co-occurring with frequency adverbs	
Event	ET1-1: Resultatives	
Type 1:	ET1-2: Verb-particles	acceptable
Telic	ET1-3: Dative/double objects	
Event	ET2-1: Boundable	acceptable when an endpoint is added
Type 2:	ET2-2: Unboundable	unacceptable in all circumstances
Atelic		

Table 3: Five types of events

We categorize the events in ET1-1, ET1-2, and ET1-3 as telic and hence bounded. These events can be framed as typical in that frequency adverbs can modify these events. ET2-1 and ET2-2 are atelic; in principle, these categories of events cannot co-occur with frequency adverbs. ET2-1 can become an exception if it is given an endpoint from the outside; however, this does not apply to ET2-2.

Four Tasks

In the present study, our main focus is on investigating children's ideological interpretation of the semantics of frequency adverbs. Building upon previous research, we have also designed comprehension tasks to elicit individuals' interpretations of linguistic terms with vague semantic networks (e.g., Beyth-Marom 1982; Hoffner et al. 1990; Kuczaj 1975). To explore children's language socialization regarding the use of frequency adverbs, we conducted four tasks in two phases. In Phase 1, we carried out an identification task and an ordering task, in order to examine the takers' ranking of the seven frequency adverbs. These adverbs correspond to the underlying meanings of these adverbs. In terms of neighboring words compatible with frequency adverbs, we devised both a context-free task and a contextual task in Phase 2a. These tasks aimed to investigate the takers' judgments of how frequency adverbs modify events.

In Phase 1, we designed an identification task and an ordering task. Here, we developed two narratives with seven characters, most of whom had common habits but at varying frequencies. The first narrative addressed the characters' habits of tardiness, while the second narrative described the characters' habits of forgetting to do their homework. We described each character's habit with one of the seven frequency adverbs. In the identification task, we informed the takers of the habits of each character, and assigned the takers the task of describing how many days each character exhibited the habit in a week.

The subjects heard

Zhe qitian yilai, Xiaoming hen guai, jihubu hui chidao, laoshi juede hen bang.

'Xiaoming is very good. He was seldom late for school in the past seven days. His teacher thinks he is great.'

Narrative 1

This ordering task revealed the takers' ordering of frequency adverbs, where, they listened to the first narrative, and completed the two tasks prior to moving on to the second narrative.

In Phase 2, we requested that the individuals pinpoint the events that co-occur with frequency adverbs. In this phase, the contextual effect was explored, and as such, we included two tasks—a context-free acceptability judgment task and a contextualized acceptability judgment task. We selected typical frequency adverbs—*changchang* ('usually'), *youshihou* ('sometimes'), or *ouer* ('occasionally')—to match with the event types (cf. Zou 2007, pp. 31-32). In the context-free acceptability judgment task, we read only the sentences that included frequency adverbs to the takers. In the acceptability judgment task with context provided, however, we added three sentences, including an endpoint, prior to the sentence that contained a frequency adverb, to clarify the context. We designed these two acceptability judgment tasks

using a three-point scale. Here, both tasks included ten questions. Table 4 and Table 5 (below) contain example questions.

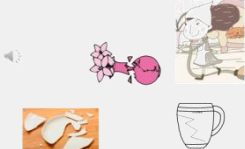

The subjects saw	The subjects heard
	<p>Mama zhe ji tian changchang bu xiaoxin da po dongxi.</p> <p>'Mom usually broke something into pieces accidentally in the past days.'</p>
	<p>Qing wen keyi zheme shuo ma?</p> <p>'Can we say a sentence like this one?'</p>

Table 5: An example question with context

As we present in the two tables above, the final sentence in the final slide of the context-provided task was identical with those of the context-free task. The difference between the two tasks was largely the inclusion of the three sentences together with three slides in the second task, to provide context.

In Phase 1, a binary code was used for the scoring policy. We compared the takers' responses to the ordering of the seven frequency adverbs with the revised classification of the seven frequency adverbs, as shown in Table 2. When a subject's ordering of a certain frequency adverb was identical with that of the revised classification, it was counted as 1; if not, it was assigned 0. In Phase 2, we selected a three-point scale. A check in the red light was counted as 0; in the yellow light, 1; in the green light, 2. The mean score of each event type was counted individually for each. Here, a mean score close to 2 indicates that the event type co-occurring with frequency adverbs is highly acceptable for the subjects. On the contrary, a mean score close to 0 suggests that the subjects tended to reject the event type with frequency adverbs. We processed the data using R, and calculated the means and standard deviation of the subjects' scores for each type of frequency adverb, in order to provide a fundamental overview of the central tendency and variability in the performances of the subjects. Additionally, we included ANOVA tests to examine significant differences in means among the groups, while also conducting post-hoc tests in order to identify potential age-related effects.

Discussion

In this section, we will discuss the results, addressing both research questions; the typicality of frequency adverbs and the influence of context on children's interpretation of these adverbs.

Typical and Atypical Frequency Adverbs

The first research question of the study addresses a difficulty order of typical and atypical frequency adverbs. As we present in Table 6, the subjects interpreted atypical frequency adverbs ($M = 0.81$) better than they did typical ones ($M = 0.50$); the overall scores of the two types of frequency adverbs differed significantly ($F(1,198) = 73.76, p < .001$). The mean scores of each group for the typical and atypical frequency adverbs appear in Figure 2.

Type	M	SD	F	p-value
Typical	0.50	0.26	73.76	2.61e-15 ***
Atypical	0.81	0.25		

Note: *** indicates that the p-value is smaller than .001.

Table 6: Subjects' interpretations of typical and atypical frequency adverbs

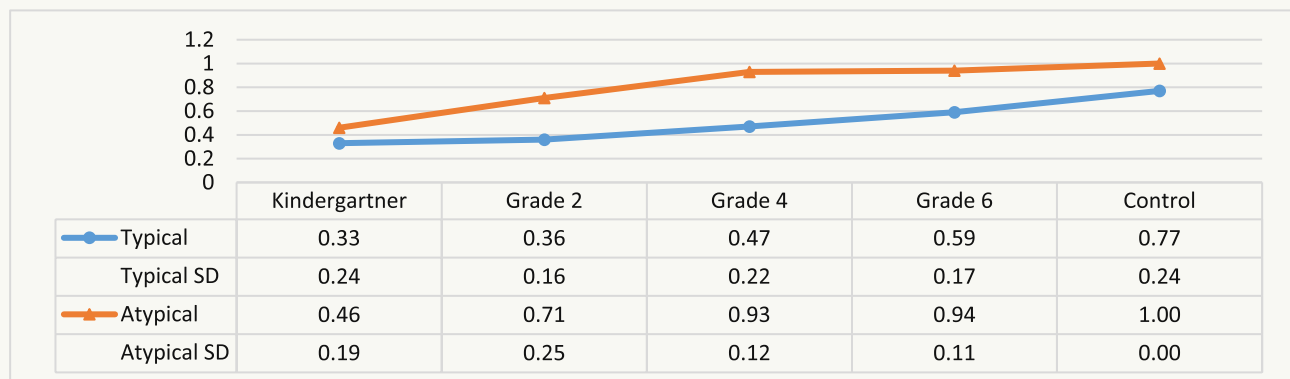


Figure 2: Interpretations of typical and atypical frequency adverbs by each group

A one-way ANOVA analysis exposes a significant difference among the five groups in interpreting typical and atypical frequency adverbs (Typical: $F(4,95) = 16.25, p < .001$; Atypical: $F(4,95) = 40.17, p < .001$). All the groups interpreted atypical frequency adverbs better than they did typical ones (Kindergarten: $M = 0.46 > 0.33$; Grade 2: $M = 0.71 > 0.36$; Grade 4: $M = 0.93 > 0.47$; Grade 6: $M = 0.94 > 0.59$; Control: $M = 1.00 > 0.77$). However, the results indicate that even the control group received a low grade ($M = 0.77$) in the typical type of frequency adverbs.

Following this etic perspective, a closer ethnographic approach revealed that some adult controls placed *youshihou* ('sometimes') and *ouer* ('occasionally') in a reverse order. According to Wu and Ding (2005), *youshi(hou)* indicates a more frequent occurrence of an event than does *ouer*, and hence, *youshihou* appears higher on the frequency scale than does *ouer*. However, the Ministry of Education dictionary (<http://dict.revised.moe.edu.tw/cbdic/index.html>) indicates that *youshi(hou)* and *ouer* are synonyms at present, affording both the same degree of frequency. As a result, we cannot conclude that the control group failed to place *youshihou* at a higher degree than they did *ouer*. Rather, the classification of frequency adverbs in Wu and Ding (2005) should be modified to fit the modern language use, as in Table 7.

Original Classification	Revised Classification	Examples
Level 1	Level 1	<i>zongshi</i> 'always'
Level 2	Level 2	<i>changchang</i> 'usually'
Level 3	Level 3	<i>youshihou</i> 'sometimes'
Level 4		<i>ouer</i> 'occasionally'
Level 5	Level 4	<i>henshao</i> 'seldom'
Level 6	Level 5	<i>jihubu</i> 'rarely'
Level 7	Level 6	<i>congbu</i> 'never'

Table 7: A further revised classification of frequency adverbs

We present the takers' overall performance on the interpretations of the two types of frequency adverbs in Table 8 and Figure 3.

Type	M	SD	F	p-value
Typical	0.70	0.22	9.59	0.00224 **
Atypical	0.81	0.25		

Note: ** indicates that the *p*-value is smaller than .01.

Table 8: Revised subjects' overall performance on the interpretations of typical and atypical frequency adverbs

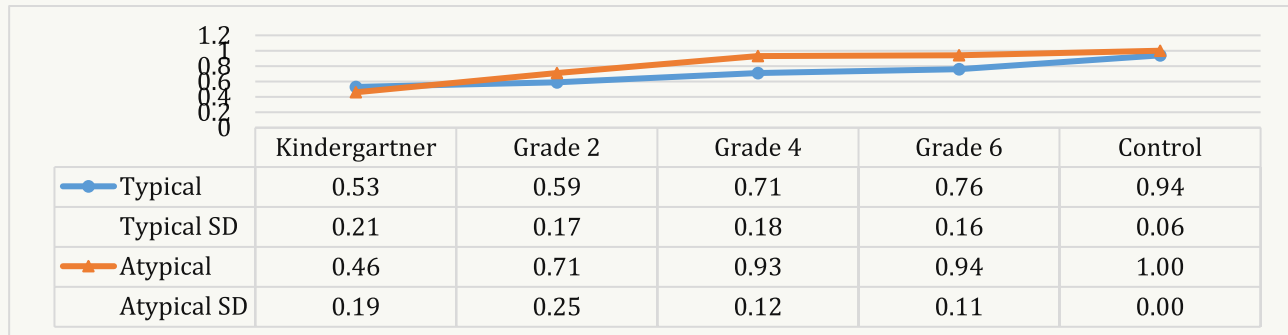


Figure 3: A revised comparison of typical and atypical frequency adverbs

The revised overall scores for the two types of frequency adverbs differed significantly ($F(1,198) = 9.59, p < .01$). There was also a significant difference among the five groups in interpreting typical frequency adverbs ($F(4,95) = 18.64, p < .001$). Furthermore, as indicated in Figure 2 and Figure 3, each group's mean score on typical frequency adverbs rose. As for each age group's interpretations of the two types of frequency adverbs, we present the within-group differences in Table 9.

	Kindergarten	Grade 2	Grade 4	Grade 6	Control
F	1.17	3.51	20.29	16.62	19
p	.29	.07	.000***	.000***	.000***

Note: *** indicates that the p -value is smaller than .001.

Table 9: The p -values for the within-group differences between the interpretations of typical and atypical frequency adverbs

We identified a significant difference in Grade 4 ($F(1,38) = 20.29, p < .001$), Grade 6 ($F(1,38) = 16.62, p < .001$), and in the adult control groups ($F(1,38) = 19, p < .001$). The result indicated that typical frequency adverbs were more difficult for the older children (grade 4 and grade 6) and the adult control groups to interpret than were the atypical ones. For the younger children (kindergarten and grade 2), differentiating the degrees in both types constituted a challenging task.

Regarding the between-group differences, Table 10 shows the p -values for the differences in the interpretations of the two types of frequency adverbs.

	Grade 2		Grade 4		Grade 6	Control		
	Typical	Atypical	Typical	Atypical	C-F	Typical	Atypical	Typical
Kindergarten	.57	***	**	***	Kinder garten	.57	***	**
Grade 2	-	-	.07	***	Grade 2	-	-	.07
Grade 4	-	-	-	-	Grade 4	-	-	-
Grade 6	-	-	-	-	Grade 6	-	-	-

Note: ** indicates that the p -value is smaller than .01 and *** is smaller than .001.

Table 10: The p -values for the between-group differences in typical and atypical frequency adverbs

With regards to the typical frequency adverbs, grade 4 and grade 6 significantly outperformed kindergarten ($p < .001$, $p < .01$, respectively), but grade 2 did not differ significantly to the kindergarten group ($p > .05$). Grade 6 significantly outperformed grade 2 ($p < .01$), but the performance of grade 6 did not differ significantly to that of grade 4 ($p > .05$). Grade 4 did not significantly outperform grade 2 ($p > .05$). However, the adult controls performed significantly better than kindergarten, grade 2, grade 4 ($p < .001$), and grade 6 ($p < .01$). With regards to the atypical frequency adverbs, grade 2 performed significantly better than did the kindergarten ($p < .001$), and grade 4 significantly performed better than did grade 2 ($p < .001$) and kindergarten ($p < .001$). grade 6 significantly performed better than grade 2 and kindergarten ($p < .001$) but not significantly differently to grade 4 ($p > .05$). The adult controls significantly outperformed kindergarten and grade 2 ($p < .001$), but not grade 4 and grade 6 ($p > .05$).

The findings revealed that it was more challenging to acquire typical than atypical frequency adverbs. The subjects' performed more strongly on the atypical than the typical categories across all age groups, with the exception of the kindergarten group, as atypical frequency adverbs show less vagueness and are more precise in meaning (Bocklich et al., 2012) than do typical frequency adverbs. For instance, *zongshi* ('always') indicates that the event occurs 'all the time,' and *congbu* ('never') indicates that the event does not ever occur. However, typical frequency adverbs share the feature of vagueness (Piao 2011; Zou 2006). Largely owing to the fact that their meanings are indefinite and unclear, they denote different degrees in any one dimension, hence posing greater difficulties for children. In addition, we found that the kindergartners performed significantly differently from the adult controls on both typical and atypical frequency adverbs, suggesting that both types of frequency adverbs were challenging for preschoolers.

With regards to the between-group comparison, the older children (grade 4 and grade 6) performed significantly better than the younger group. This suggests that, by the fourth grade, children are capable of interpreting atypical frequency adverbs in ways similar to adults. However, for typical frequency adverbs, even grade 6 had not yet developed the competence to apply an adult-like semiotic interpretation, demonstrating the feature of ambiguity of typical frequency adverbs (Piao 2011; Zou 2006).

We located an age-related increase in children's ability to discriminate among these frequency adverbs. This is consistent with previous findings (e.g., Cohen and Hansel 1956; Kuczaj 1975), though this previous work is now somewhat dated, and hence our finding presents a welcome update. The acquisition denoting various degrees within one dimension begins at around the age of ten, which is in accordance with Hoffner et al. (1990), who argue that children acquire absolute positives and negatives before they understand the meanings of inner members in an ordered semantic set. Children do not acquire the meanings of words until they have developed the necessary social skills to understand the underlying concepts (e.g., Clark and Clark 1977; Kuczaj 1982). That is to say, children's socialization into frequency adverbs correlates with their socialization into distinguishing various degrees. Piaget and Inhelder (1975) concluded that children have not yet been socialized into a competence to compare different degrees of probability until they become adolescents. Similarly, frequency adverbs denote different degrees within a dimension; hence, children may not fully interpret frequency adverbs until they become adolescents. According to Piaget's theory of development, eleven-year-olds enter the formal operation stage and begin to develop the ability to think about abstract symbolisms (1964). Frequency adverbs constitute abstract concepts which assist in the understanding of the motives children above eleven have to begin to become socialized into interpreting this type of adverb. Furthermore, this later development may present an attribute for the need for more than one intelligent affordance. Gardner (2011) identifies several such 'intelligences' and hence symbolic affordances, including linguistic, logic-mathematical, musical, spatial, bodily/kinesthetic, interpersonal, intrapersonal naturalistic and spiritual intelligences, in his theory of multiple intelligences. People interpret frequency adverbs through their language intelligence. However, when comparing different degrees of a set of related words, they must also apply their logic-mathematical intelligence. Here, both intelligences become necessary to effectively interpret frequency adverbs.

Contextual Clues

Table 11 presents the mean scores of events in which frequency adverbs occurred in both context-free and in contextualized tasks. The subjects accepted frequency adverbs when they modified events in the context-free task ($M = 1.18$) significantly better than in they did in the task with context ($M = 0.96$) ($F(1,1998) = 31.65, p < .001$).

Context	M	SD	F	p-value
No context	1.18	0.89	31.65	2.11e-08 ***
Context provided	0.96	0.90		

Note: *** indicates that the p-value is smaller than .001.

Table 11: Subjects' acceptability of frequency adverbs modifying events in context-free tasks and tasks with context provided

Figure 4 presents each group's acceptability ratings for events where frequency adverbs occurred in context-free and in contextualized tasks. Similar to our findings above, only the kindergartners responded differently to the other groups.

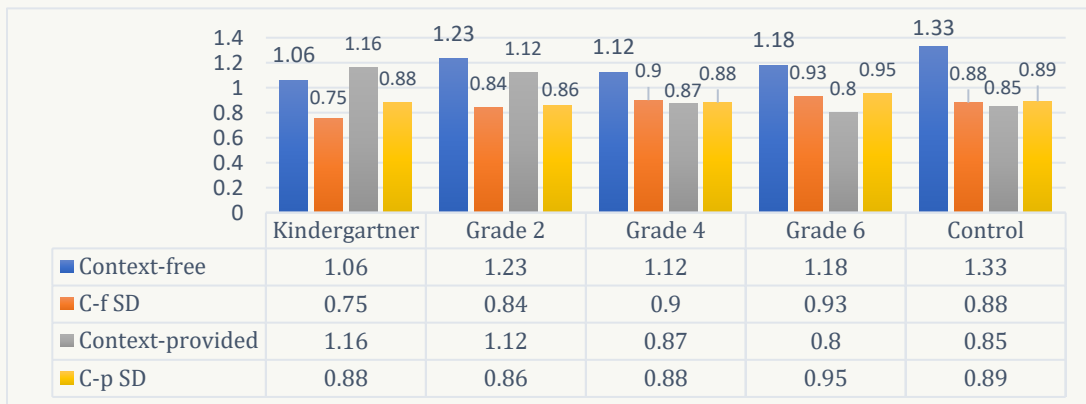


Figure 4: Each group's acceptability ratings for frequency adverbs without context and with context

Likewise, the one-way ANOVA indicated that there was a significant difference among the five groups in the two tasks (without context: $F(4,995) = 2.82, p < .05$; with context: $F(4,995) = 7.11, p < .001$). In viewing each group's acceptability ratings, only the kindergartners show significance in the events in which frequency adverbs occurred in the task with context ($M = 1.16$) more highly than in the context-free task ($M = 1.06$). The other groups accepted frequency adverbs when they modified events in the context-free task more so than those in the task with context provided (Grade 2: $M_{cf} = 1.23 > M_{cp} = 1.12$; Grade 4: $M_{cf} = 1.12 > M_{cp} = 0.87$; Grade 6: $M_{cf} = 1.18 > M_{cp} = 0.80$; Control: $M_{cf} = 1.33 > M_{cp} = 0.85$). With regards to each age group's acceptability of frequency adverbs in the two tasks, we provide the within-group differences in Table 12.

	Kindergarten	Grade 2	Grade 4	Grade 6
F	1.40	1.82	8.18	16.44
p	.24	.18	.004**	.000***

Note: ** indicates that the p -value is smaller than .01 and *** is smaller than .001.

Table 12: The p -values for the within-group differences between tasks without context and tasks with context

We found a significant difference in both the older children and the control group (Grade 4: $F(1,398) = 8.18, p < .01$; Grade 6: $F(1,398) = 16.44, p < .001$; Control: $F(1,398) = 29.97, p < .001$), who indicated that they accept frequency adverbs at times when they modify events in the task with context significantly lower than in the task without context. That is, the contextual clues reduced their acceptability ratings. However, the younger children did not respond significantly differently to the two tasks (Kindergarten: $F(1,398) = 1.40, p > .05$; Grade 2: $F(1,398) = 1.82, p > .05$), indicating that they did not benefit from contextual clues.

Regarding the between-group differences, Table 15 contains the p -values for the differences in the acceptability of frequency adverbs in the two tasks.

	Grade 2		Grade 4		Grade 6		Control	
	C-F	C-P	C-F	C-P	C-F	C-P	C-F	C-P
Kindergarten	.35	1.00	1.00	**	.96	***	*	**
Grade 2	-	-	.98	*	1.00	**	1.00	*
Grade 4	-	-	-	-	1.00	1.00	.17	1.00
Grade 6	-	-	-	-	-	-	.64	1.00

Note: * indicates that the p -value is smaller than .05, ** indicates that the p -value is smaller than .01 and *** indicates that the p -value is smaller than .001.

Table 13: The p -values for the between-group differences in the acceptability of frequency adverbs in tasks without context and tasks with context

The post hoc comparison suggests that in the task without context, only the adult control groups responded significantly differently from the kindergartners ($p < .01$). The other comparisons of between-group differences did not suggest a significant difference ($p > .05$). As for the task with context provided, the adult control groups, grade 6, and grade 4, all showed responses that significantly differed from grade 2 ($p < .05$, $p < .01$, $p < .05$, respectively) and kindergarten ($p < .01$, $p < .001$, $p < .01$, respectively). However, grade 2 did not respond significantly differently from the kindergarten ($p > .05$).

In addition to the general acceptability ratings for frequency adverbs that modify events, Zou (2007) argues that some atelic events with a verb such as *xiang* ('think') become telic once they receive an endpoint from the outside. Therefore, we examine ET2-1 to determine the extent to which contextual clues including an endpoint will provide atelic events with a telic affordance:

Event Type	Context	M	SD	F	p-value
ET2-1	Context-free	1.10	0.87	25.74	.000***
	Context provided	0.66	0.84		

Note: *** indicates that the p -value is smaller than .001.

Table 14: Overall acceptability ratings for frequency adverbs modifying ET2-1 in the two tasks

As in Table 14, acceptability ratings for frequency adverbs in the context-free task ($M = 1.10$) were higher than in the task with context ($M = 0.66$); the difference reached a significant level ($p < .001$), indicating the significantly lower acceptability rating with contextual support.

The role of context has been widely discussed in a variety of language socialization studies (e.g., Belke et al. 2005; Beyth-Marom 1982; Cacciari and Levorato 1989; Friedrich and Friederici 2004; Hoff 2010; Qian 1996; Schatz and Baldwin 1986; Stanovich 1986; among others), finding that contextual clues facilitate comprehension. However, some studies argue against the positive effect of contextual support. For instance, Schatz and Baldwin (1986) found that context did not provide the person with clues adequate for comprehending low-frequency words, and they regard context as an unreliable predictor of word meanings.

The present findings indicate that contextual clues do not generally assist our takers to accept frequency adverbs when modifying events. For the younger children (kindergarten and grade 2), contextual clues neither raised nor lowered their acceptability ratings. As for the older children (grade 4 and grade 6) and the adult controls, their acceptability rates were significantly higher in the context-free task than they were in the task with context provided, demonstrating the fact that context indicated a negative influence on the older takers when interpreting vague expressions such as typical frequency adverbs. One possible explanation for

this result is that the judgment of typical frequency is subject to individual differences. In the event *nong po dongxi* ('break something into pieces'), for example, doing this twice a week is *ouer* ('occasionally') for some people, but others see the frequency as *changchang* ('usually').

Conclusion

In the present study, we examined children's first language socialization into Chinese frequency adverbs from the perspective of interpretation of these frequency adverbs. Typical frequency adverbs are vaguer in meaning than atypical frequency adverbs, thus decreasing the performance of the child subjects. In addition, contextual clues did not raise the subjects' acceptability ratings of frequency adverbs in modifying events.

We also discovered an age-related pattern in the socialization into Chinese frequency adverbs in the study. According to Piaget's (1964) theory of development, our kindergartners should be at the preoperational stage (2 to 7 years old), which suggests they are self-centered, and their logic is not well developed. Likewise, the second graders began to prefer frequency adverbs in telic events over those in atelic events, and were not sensitive to contextual clues. However, we identified a dramatic change in the responses of grade 4 subjects, who are at the concrete operational stage (7 to 11 years old). Children at this stage are characterized by the appropriate use of logic, thus explaining the progress they achieved compared with the younger subjects. They were able to show adult-like interpretations of atypical frequency adverbs. Our sixth graders are at the final stage in Piaget's theory—the formal operational stage (11 to 16 years old). During this period, adolescents begin to develop the ability to interpret abstract concepts, thus explaining their lowered competence to interpret typical frequency adverbs in comparison to the adults.

Future work can determine the developmental pattern of children's interpretations of Chinese frequency adverbs, as we recognize some limitations, such as the fact that the present study only selected four age groups (i.e., kindergartners, grades 2, 4, and 6). As the oldest experimental group (i.e., grade 6) still had not acquired adult-like interpretations of typical frequency adverbs, subjects over twelve years old should be recruited in future research. In addition, although we identified a negative effect of contextual clues in the present study, this effect may possibly be attributed to some unexpected meanings of words on some occasions (Looby 1939). These two issues should be explored in future research.

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Acknowledgements

This work was financially supported by the Chinese Language and Technology Center of National Taiwan Normal University (NTNU) within the framework of the Higher Education Sprout Project by the Ministry of Education (MOE) in Taiwan.

Corresponding Author

Chun-yin Doris Chen, National Taiwan Normal University, Taiwan

Endnotes

- 1 Kuczaj (1975) views the ordered set of frequency adverbs as a positive-negative dimension, with always denoting a strong positive likelihood and never denoting a strong negative likelihood.
- 2 The present study uses *congbu* ('never') to replace the more challenging word, *congwei* ('never'), used in Wu and Ding (2005).
- 3 High-value frequency adverbs are used to indicate that a particular event happens extremely frequently in a period of time. Medium-value frequency adverbs imply a particular event happens many times in a period of time. Only two expressions of this category were found in the data. Low-value frequency adverbs indicate a particular event happens rarely in a period of time. In the data, only *youshihou* ('sometimes') occurred.
- 4 The term in Wu and Ding (2005) is *congwei* ('never') but it is too difficult for children, so the present study replaces it with an easier term, *congbu* ('never').
- 5 The following sentence is an example of resultative V-de, which is formed by combining an activity verb with a de-clause to denote the result of the action:
Ta changchang ma de ta jiang bu chu hua lai.
he usually scold DE she speak not out word come
'He usually scolds her so harshly that she cannot say a word.'

- 6 In Mandarin, there are two variants of this type, as exemplified in (i) and (ii):

(i) V GEI NP1 NP2

Wo changchang song gei ta hua.
I usually give GEI him flowers
'I usually give him flowers.'

(ii) V NP2 NP1

Wo changchang song ta hua.
I usually give him flowers
'I usually give him flowers.'