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Imperfective and Perfective Aspect Comprehension in Bilingual Mandarin-

English Children

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Imperfective and Perfective Aspect Comprehension in Bilingual Mandarin-

English Children

by

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Report

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Abstract

Imperfective and Perfective Aspect Comprehension in Bilingual Mandarin-English Children

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As bilingual populations continue to grow throughout the world, there is a greater need to better understand how language is acquired in bilinguals and find common patterns of language development for clinical purposes. The goal of this study is to better understand the acquisition of aspect markers in bilingual Mandarin-English children who are growing up in an English-dominant environment. 14 typically developing bilingual children from ages 3 to 5 participated in the study. Children were asked to interpret a spoken sentence that contained either a perfective or imperfect aspect by selecting the correct picture on a computer screen. Results revealed significant correlations between performance on –ed and –le, the perfective aspect markers in English and Mandarin, and provided evidence of morphosyntactic transfer with respect to

aspect marking. No significant correlation was found for –ing and zai, the imperfective aspect markers for English and Mandarin. Also, children performed significantly better when comprehending sentences with imperfective aspects. In addition, significant correlations were found between age and aspect proficiency, but not between amount of current language use and aspect proficiency. Finally, clinical implications and future directions are discussed.

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INTRODUCTION

The increase in bilingual populations throughout the world requires more research about how areas of language are acquired by bilinguals. How monolinguals and bilinguals acquire languages is expected to be different, as the two languages are likely to interact with one another (Gawlitzek-Maiwald & Tracy, 2009). There are studies that have found cross-linguistic transfer in bilinguals across different areas of speech and language, but the type and amount of transfer is dependent on other factors, like the similarities and differences between the languages. Studying how languages interact and transfer can help us to better assess, diagnose, and treat our bilingual population. In terms of assessment, understanding how language is acquired in bilinguals can help us differentiate between what is considered typical and what is considered impaired. Studies have shown that problems with morphosyntax are indicators of language impairment for those who are monolinguals (Stokes & Fletcher, 2003), and so it is worth investigating patterns of typical vs atypical morphosyntax development in bilingual speakers.

There has been comparatively less research that looks at Mandarin-English transfer, especially at the transfer of temporality in the form of grammatical aspect markers (Huang, 2006). Aspect markers are morphosyntactic markers that provide temporal information in relation to a verb, and have the

potential to help differentiate those who are typically developing and those who have specific language impairment across a variety of bilingual populations (Fletcher, Leonard, Stokes, & Wong, 2005; Konstantzou, van Hout, Varlokosta, & Vlassopoulos, 2013). The primary purpose of this preliminary study is to investigate the presence of cross-linguistic transfer of aspect markers between Mandarin and English. In addition, this study will investigate general patterns and differences between aspect markers within the same language.

Our introduction section begins with evidence of bilingual transfer amongst different areas of language, with an emphasis on the morphosyntax domain. We then review and compare the ways imperfective and perfective aspect markers are acquired in bilinguals. Then, we look at the role that age and language experience play on language proficiency. Finally, we present an introduction of Mandarin and English aspect markers and the role of aspect markers on event recognition.

Bilingualism Influence and Transfer

Bilinguals are not simply two monolinguals in the same body. It has been said that a bilingual's languages are active and accessible even while they are using one of the languages (Kroll, Bobb, & Wodniecka, 2006). When speaking in one language, the other is deactivated, but still readily available. As there are

situations where bilinguals switch from one language to another, bilinguals develop flexibility to access information from both languages. However, one inevitable consequence of this is that the inactive language will likely influence the activated language. This consequence is called transfer (or sometimes referred to as interference or cross-linguistic influence). The following are examples of this occurrence through research in different areas of speech and language.

Evidence of Morphosyntax Transfer

Herschensohn, Stevenson, & Waltmunson (2005) studied the development of Spanish morphosyntax in English-Spanish bilinguals. Specifically, they investigated whether L2 syntax and morphology develops independently or dependently with L1 syntax and morphology. 26 children whose L1 was English and attended an immersion program at their school where they were exposed to both English and Spanish participated in the study. In addition, 5 children who were native Spanish speakers served as the control group. Children were evaluated using one comprehension test and two production tests, which tested a variety of morphological forms. Overall, they found differences in morphology and syntax between the Spanish native and Spanish learners group. They found that the Spanish learners performed significantly better on the comprehension test, but those who were native speakers performed at the same level for both kinds of tests. Children learning Spanish answered questions using the subject-verb-object

order even though the questions posed were in the object-verb-subject order. Looking at the kinds of morphological errors, non-native speakers tend to pay more attention to bound morphemes. There are also productions that are similar in both groups of children. For example, both groups produced more simple present tenses, and syntax and word order were generally accurate. These results indicate that children are beginning to acquire aspects of L2, but L1 was still a crucial influence at the initial stages.

Davison & Hammer (2008) investigated the differences in English grammatical morpheme production in monolingual English children and Spanish-English bilingual children. The bilingual group was further differentiated into 2 groups: those who were bilinguals from birth and those who learned English after attending school. They found variations in acquisition of morphemes between the monolingual and bilingual groups: uncontractible copula was mastered later in bilingual children, irregular past tense was acquired earlier in bilinguals, and possessives emerged later in bilinguals. Variations also emerged between the 2 bilingual groups. These kinds of variation, especially between the monolingual and bilingual groups, indicate some cross-linguistic effects.

Lastly, in a longitudinal and concurrent study, Luo, Chen, & Geva (2014) looked at the transfer of phonological and morphological awareness in Chinese-English bilingual children at the construct and reading levels. Construct tasks refers to verbally compounding sounds and words, while reading tasks refers to

decoding sounds and words. 91 typically developing bilingual kindergarten and first graders participated, and data was taken at the beginning of the study and one year afterwards. The assessments included phonological awareness, morphological awareness, verbal ability, and word-level reading in both Chinese and English. Chinese phonological awareness and English phonological awareness were seen to be predictive of one another at the construct level. However, they did not find this kind of direct correlation when looking at the longitudinal data. Authors concluded that transfer likely happens between Chinese and English at the phonological level because they do share 3 aspects of phonological awareness: syllable, onset-rhyme, and phoneme. In addition, transfer of morphological awareness also occurred between Chinese and English at the construct level, but not at the word reading level. This is consistent with other studies and suggests that morphological awareness is more of a language-specific construct (Min, Cheng, & Chen, 2006; Adrian, Chen, Lam, Luo, & Ramirez, 2011). Specifically for Chinese and English, reading Chinese requires more compound awareness (70-80% of Chinese words are compound words) while reading English requires more phonological awareness. Implications of their study suggests that this kind of cross-linguistic transfer can benefit bilingual children as linguistic knowledge established in one language can be helpful for establishing literacy skills in the other language.

Evidence of Transfer in Other Areas of Language

Grech and Dodd (2008) looked at the phonological acquisition of 241 Maltese-English bilingual children aged 2;0 to 6;0. These children were asked to name pictures in the language of their choice, and errors patterns in their speech were analyzed. They found that for children who were only exposed to Maltese at home performed significantly poorer than those who were exposed to both languages. Authors concluded that though the phonological systems are part of two different language groups (Semitic and Indo-European), they did interact and that exposure to both allowed faster phonological acquisition.

In bilinguals, as many concepts are shared across languages, there is evidence of some semantic integration of the two languages (Basden, Bonilla-Meeks, & Basden, 1994), but because concepts may be represented differently across languages, there are still differences in semantic representation for the 2 languages. Colome (2001) found that lexical activation for a bilinguals' speech production in the target language was affected by lexical knowledge from the non-target language, which was an indication of cross-linguistic transfer. Another example of semantic transfer was found in a study with Russian-English bilinguals, conducted by Marian & Kaushanskaya (2007). Transfer occurred more when participants spoke their L2, which suggests that L1 semantic representation is fairly stable and less likely to be influenced by the other language.

Acquisition of Imperfective and Perfective Aspect Markers

Martelle (2011) conducted two studies that looked at the L2 acquisition of Russian aspect markers and compared the use of imperfective and perfective verb forms in the past tense. In the first study, 42 English-Russian bilinguals were asked to produce a written narrative of a silent movie clip in Russian. She found that for advanced Russian speakers, more perfective aspects were used, but for beginners and intermediate learners of Russian, imperfective aspect markers were preferred. In the second study, another 42 English-Russian bilinguals were asked to produce an oral narrative of a silent movie clip in Russian. Imperfective aspects were also more prevalent for beginners and intermediate learners of Russian. Martelle postulated that this pattern of using imperfective past more often in beginners is due to several reasons: imperfective past is typically introduced and taught first to express an event in the past, the participants' L1, English, also has a similar tense structure (simple past), and lastly, because Russian perfectives can be expressed in more complicated ways, with greater complexity. In addition, more imperfective markers were produced orally than when participants were asked to write the narrative. This is possibly because they had less planning time orally and reverted to what was less difficult to produce. In addition, there have been studies with contrasting results. For example, in a study by Jia & Fuse (2007), researchers found the imperfective aspect was one of the first morphemes to be acquired by Mandarin speakers learning English, but Davison & Hammer

(2012) found that the perfective aspect was one of the first morphemes to be mastered by Spanish-English bilingual children. In general, Bedore & Pena (2008) concluded that acquisition of grammatical development in L2 would likely depend on factors such as context of exposure of L2 (ex: differences in instruction), amount of exposure to L2, and differences in syntactic properties between L1 and L2. In general, little research has been conducted about the development of aspect markers when acquiring a second language.

Role of Age and Language Experience

Research shows that there is a significant relationship between age and language proficiency, and language experience/use and proficiency in various domains of language. Sheng, Bedore, Pena, & Fiestas (2013) investigated the semantic development of 60 Spanish-English bilingual children who differed in language experience (higher English experience and high Spanish experience). They found that language experience was significantly correlated with semantic knowledge and forming semantic connections. In addition, Hammer, Lawrence, & Miccio (2008) looked at the effects of language experience on receptive vocabulary and language comprehension in Spanish-English bilinguals children. The bilingual children were either exposed to English starting from preschool or had exposure since birth. Researchers found that language development in the tested areas grew in a linear fashion for both groups of children and that at the end

of two years, bilingual children were catching up to their monolingual peers. This shows that language experience does have a direct impact on vocabulary and receptive language proficiency. With respect to morphology, Jia & Fuse (2007) performed a longitudinal study, looking at the acquisition and proficiency of English grammatical morphemes in Mandarin participants learning English. They found that by the end of 5 years, language environment was a stronger predictor of mastery of these morphemes compared to even age of arrival. Finally, Alhawary (2009) investigated the acquisition of Arabic as a second language in Japanese, English, and Spanish young adults. Specifically, he looked at differences in acquisition of aspect and subject verb agreement. Surprisingly, he found that, overall, Japanese bilinguals outperformed both English and Spanish bilinguals in both aspect and subject verb agreement, and attributed this to that fact that Japanese speakers were given almost double the amount of Arabic education.

Aspect markers in Mandarin

Mandarin is one language that contains grammatical aspect, which are morphosyntax markers that provide temporal information when associated with a verb. There are four main groups of grammatical aspects: the perfective marker – le, the progressive marker zai, the durative marker –zhe, and the experiential

marker –guo. For the purposes of this study, the focus will be on the perfective

marker –le and progressive zai.

–Le

The perfective –le indicates the completion or termination of an event. It can

occur after a verb, at the end of a sentence, or after a verb and at the end of a

sentence. Here are some examples.

1) Wo   chi le yi   ge   pingguo.

 I   eat LE one classifer   apple

"I ate an apple"

2) Wo shui wan jiao le

I sleep-finish nap LE

"I have slept"

3) Wo ku le.

I cry LE.

"I cried"

According to a longitudinal study of four Taiwanese children by Erbaugh (1992) –le is the earliest acquired aspect marker in Mandarin children and it is the most common marker produced in their speech output.

zai

The imperfective zai is a dynamic marker that indicates an event is ongoing. Zai is mostly associated with atelic verbs and does not occur with stative verbs in natural speech. This makes sense as telic verbs are verbs that imply the action has a defined endpoint or completion, and stative verbs are verbs that are static and describe a state of being rather than an action. Here is an example of how zai may be used.

    Wo zai du shu.

   I **ZAI** read book.

  "I am reading a book."

The close association between specific aspects and certain verb classes is explained by the aspect hypothesis, which states that the acquisition of aspect markers is strongly affected by the verb semantics across all languages (Shirai & Li, 2000). For the purposes of this paper, the aspect hypothesis will not be heavily discussed, but it is introduced because it is an important part of understanding

aspect markers. The hypothesis is based on four verb classes: state, activity, accomplishment, and achievement. Each of the classes is defined by the presence and lack of three semantic features: dynamic, telic, and punctual. For example, according to Andersen & Shirai (1996), some generalizations about the acquisition of aspect markers are that children tend to use past tense or perfective markers with accomplishment and achievement predicates before using them with activity and stative predicates, imperfective past markers develop before perfective past markers, children tend to use progressive markers with activity predicates first, and children do not overextend progressive markers to stative verbs. These generalizations simply give a guideline and may have exceptions depending on the typology of the language and the kind of language input as well (Chen & Shirai, 2010). For example, because in English past tense is obligatory, these grammatical markings are consistent, but in Mandarin, there are various ways to express the past. In addition, children are more strongly and developmentally constrained when it comes to the aspect hypothesis, but as they get older, this association lessens.

With respect to zai, in Li & Bowerman (1998), researchers performed three experiments, looking at the acquisition of lexical and grammatical aspects in Chinese. They actually found that, contrary to previous studies, children do make errors with zai by overgeneralizing its use with stative verbs. However, Shirai (1994) conducted an experiment that collected speech samples from three

English-speaking children and their mothers. They looked at the predicate and progressive marker association patterns and concluded that this kind of overgeneralization occurs in experimental settings, not in naturalistic, conversational settings.

Aspect markers in English

In English, tense and aspect are conflated. The –ed form represents both the past tense and the perfective aspect. The –ing form represents the progressive aspect (or the imperfective aspect). This present study will focus on these two markers and will refer to them as aspects.

Aspect Markers and Event Recognition

Individuals use linguistic and non-linguistic information to process a sentence and understand the events represented. For example, linguistic components such as aspect and tense give information about the beginning and end of an event in a sentence. Experiments have used eye-tracking instruments to measure speed and duration of fixation on the item based on how the participants process the sentence. For example, in a study by Altmann and Kamide (1999), they used eye-tracking instruments and found that when participants heard the sentence "The boy will eat cake", they looked at the picture of a cake even before the word "cake" was said. Eye-tracking instruments provide insights about

immediate language and cognitive processing that may not be possible with offline behavioral measures (ex: success rate).

Zhou, P., Crain, S., & Zhan, L. (2014) explored the role of grammatical aspects in helping Mandarin children encode temporal information and recognize an event during an online sentence comprehension task. Specifically, they focused on 2 Mandarin aspectual morphemes: the perfective –le and the durative –zhe. They recruited 34 Mandarin-speaking adults and 99 Mandarin speaking children for the study. Using an eye-tracking system, they found that when hearing the aspectual marker, for all age groups, there was higher proportion of fixations on the image that represented the correct temporal event. For example, when hearing the perfective aspect –le, there was high proportion of fixations on the picture with the completed event compared to the picture with the ongoing event. Zhou et al. (2014) discovered that there was no significant difference among any of the age groups, which indicates that amongst typically developing children, even as young as age three, there is the ability to use temporal information encoded in grammatical aspects to recognize an event. This is important for the purposes of our study as we ask children as young as age three to discern events based on their understanding of aspect markers.

Present Study

The present study focused on event recognition in Mandarin-English bilingual children aged from 3;0 to 5;5. We examined the imperfective and perfective event markers in Mandarin ("zai" and "-le") and English ("-ing" and "-ed"). We sought to answer the following questions: 1) Is there evidence of cross-linguistic transfer when these children comprehend the tested aspects? 2) Are there differences between performance for the perfective and the imperfective aspects? 3) What are the roles of age and experience in the acquisition of event recognition in Mandarin and English?

METHODS

Participants

Fourteen bilingual Mandarin-English children (8 girls, 6 boys) between the ages of 3;0-5;5 participated in this study. All children had no history of speech and language impairment. They all resided in Austin, TX. All children were tested by 2 experimenters. Parents were asked to fill out a Parent Questionnaire (Appendix A) that provided demographic information and information pertinent to the child's language ability. The questionnaire included questions about the child's overall language use throughout a week, as well as his or her language proficiency in the areas of vocabulary, grammar, sentence length, speech pronunciation, and listening comprehension using a 5-point scale (1= low proficiency, 5= high proficiency). The average of these values were calculated to obtain a proficiency score in both English and Mandarin. Table 1 presents information about each participants' age, gender, language use, averaged language proficiency rating, and calculated language dominance.

Table 1: *Participant Characteristics*

Participant #	Age (Months)	Gender	English Use (%)	Mandarin Use (%)	English Proficiency	Mandarin Proficiency	Language Dominance
1	56	F	78	22	5	4.2	B
2	36	M	83	17	4.2	2.6	E
3	39	M	48	52	3.6	4.2	B
4	58	M	80	20	4.6	2.8	B
5	65	F	58	42	3.6	3.2	B
6	65	F	60	40	4.2	4	B
7	42	M	60	40	3.6	3.6	B
8	62	F	57	43	3.4	4.6	B
9	57	F	43	57	4.4	4.6	B
10	64	F	72.5	27.5	4.4	4.4	B
11	36	F	43	57	3	3.5	B
12	44	M	24	76	2.2	5	B
13	65	M	29.5	70.5	3	4.8	B
14	46	F	71	29	2.8	3.4	B

Note: B= bilingual (at least 20% use for each language); E= English dominant

(>=80% for English use)

Stimuli and Procedures

The two experimenters administered the English and Mandarin aspect tests, the English and Mandarin pronoun tests, the Parent Questionnaire, and if time allowed, as much of the Mandarin section of the Bilingual English-Mandarin Oral Screener (BEMOS) as possible. The order of the tests (aspect and pronoun)

as well as the test language (Mandarin and English) was counterbalanced to eliminate order effect. Although other tests were also administered along with the aspect tests, for the purpose of this paper, only the aspect test and its results will be reviewed and discussed.

Prior to starting the test, participants were told that they were going to help a puppet friend learn English and Mandarin:

"Emily/David (the puppet) is learning English. He/she can't understand much English. Let's teach him/her by looking at pictures! I will say a sentence and show you two pictures. I want you to point to the picture, which goes with the sentence, and show it to Emily/David. Let's practice first."

The English and Mandarin aspect tests each contained 2 practice items, 8 fillers, and 12 test items. The test begins with practice items that are intended to familiarize the child with the tasks. Positive reinforcement was given if the child responded correctly to these practice items. For example:

"If the child picks the correct picture, say, "Good job! Now Emily/David knows which picture shows "This is a granny".

If the child repeated the sentence but did not point to a picture, or if he or she pointed to the wrong picture, the child was prompted and corrected. After the practice items, no feedback was given for the remainder of the test items. 6 of the test items included imperfective aspects (-ing for English and zai for Mandarin)

and 6 included perfective aspects (-ed in English and –le for Mandarin). The pictures that corresponded to the test items were displayed on a personal computer (PC) screen. There was no ceiling for these tests. Data was collected on paper forms, and the entire testing period was audio recorded for each child.

In addition, one or both of the parents were asked to complete a questionnaire that contained questions about demographic information, language environment, and the child's proficiency rating in each language (vocabulary, speech, sentence length, grammar, and comprehension). Parents were also asked to document their child's hour-by-hour language use during the week and weekend. Parents were asked to describe whom the child interacts with during these times, what language the child hears, and what language the child speaks. The percentages of language input and output were derived from information from this section of the questionnaire. The questionnaire and interview were taken from previous research that used them to report bilingual children's language profile (Gutiérrez-Clellen & Kreiter, 2003; and Restrepo, 1998).

RESULTS

Given the small sample size and the distribution of the data (Table 2), the Wilcoxon signed-rank test was used to compare the children's performance in understanding perfective and imperfective aspect markers across languages, as well as their performance in understanding perfective and imperfective aspect markers in each language. This test was chosen because it is a nonparametric t-test that looks at the significance of the difference between 2 correlated samples.

Table 2: *Participant Overall Scores*

Participant #	Age (Months)	Mandarin "le"	English –ed	Mandarin "zai"	English –ing
1	56	0	2	6	6
2	36	5	4	4	5
3	39	2	1	6	4
4	58	4	3	6	5
5	65	6	5	6	6
6	65	4	4	6	6
7	42	3	2	5	5
8	62	3	4	4	5
9	57	4	3	6	6
10	64	2	2	6	6
11	36	2	1	6	4
12	44	4	2	6	6
13	65	2	3	5	6
14	46	4	2	4	6
Accuracy (%)		54%	45%	90%	90%

The Wilcoxon Signed-Rank Test revealed that there was no significant difference between the children's performance on understanding the perfective Mandarin and English aspect markers –le and –ed ($z=1.39$, $p>0.05$) and the imperfective aspect markers zai and –ing ($W<24$). No z-score was calculated when comparing imperfective markers. This is because most of the scores were tied, causing the comparable sample size to be too small for a z-score to be calculated. The Wilcoxon test also revealed a significant difference between the children's performance on understanding the Mandarin aspect markers zai and "le" ($z=2.29$, $p<0.05$) and the English aspect markers –ing and –ed ($z=3.28$, $p<0.05$). The average accuracy for each aspect marker is presented in the bottom row of Table 2. In addition, although children performed well for zai and –ing (averages were 90%), the correlation coefficient (r) between the imperfect aspects Mandarin zai and English –ing was only .05. No correlation was found because the range of scores was too narrow as most children either scored 5 or 6 for both aspects. The correlation coefficient (r) between the perfective aspects Mandarin –le and English –ed was found to be .66 ($p<0.05$). This significant and positive correlation shows that children who paid attention and understood –le also correctly responded to the –ed.

The correlation coefficient was also calculated to understand the roles of age and experience in the acquisition of event recognition in Mandarin and English. The following table contains these calculations:

Table 3: *Correlation (r) between accuracy and age/experience*

	Mandarin "le"	English –ed	Mandarin "zai"	English –ing
Age	.033	**.563***	.197	**.640***
English Input (%)	-.026	-.017	-.321	.172
Mandarin Input (%)	.026	.017	.014	-.012
English Output (%)	.156	.313	-.0321	.172
Mandarin Output (%)	-.156	-.313	.0321	-.172

Note: Data of input and output gathered from the child's hour-by-hour language use from the Parent Questionnaire.

*p<.05

Significant and positive correlations were found between age and accuracy in English aspect markers (*p*<.05 for both markers). This indicates that as children grow older, they are likely to perform better in event recognition in English. On the other hand, the correlations between age and accuracy in Mandarin aspect markers were not significant. Partial correlations were conducted between accuracy and experience (measured by language input and output), controlling for age, and results showed that there were no significant correlations between language experience and performance for any of the aspect markers.

DISCUSSION AND IMPLICATIONS

Our study shows some evidence of cross-linguistic transfer when children comprehend the tested aspects. This is demonstrated through the significant correlation between perfective markers across languages. In addition, although each child performed well during comprehension of imperfective markers, correlation between the two was low due to the narrow range of the scores. Based on our study, we do find potential evidence of transfer when children comprehend perfective aspect markers. This transfer is likely due to the fact that understanding of these aspects is strongly related to the ability to recognize events. Because event recognition is both a cognitive and a linguistic task, generalizations across languages may take place even though the linguistic forms are different. For example, the two sentences "Tina is counting money" and "Tina counted money" contain the same content words, but because of the differences in aspect, how one pictures the event in his or her mind will be different. Saying the exact two sentences in different languages will not affect how one pictures or perceives the event. Aspect markers help us to create an accurate picture of the event and provide information about the timeline of the event and how the event unfolds.

Madden & Zwaan (2003) examined the influence of verb aspects on creating situation models. They found that participants chose pictures with completed events after they read a sentence containing a perfective aspect. In addition, they were faster at responding to pictures with completed events after

reading perfective sentences, and were faster at reading perfective sentences after they saw pictures with completed events. This kind of pattern was not seen with imperfective sentences. These authors concluded that perfective aspects influences conceptual information and creation of situation models. Imperfective aspects may not impose such a constraint on mental representation of events because participants were able to represent these events at various stages prior to the event's completion.

In a study by Ferretti, Kutas, & McRae (2007), researchers examined the influence of verb aspects on event knowledge using both behavioral and electrophysiological measures. Using event-related brain potential (ERP) methodology during an online sentence comprehension task, the authors measured the amplitude of the N400 component since it provides information regarding semantic processing and lexical expectancies. Smaller amplitudes between 300 ms and 500 ms post-stimulus indicate that words are highly semantically expected. The examiners looked at the amplitude size for 4 types of sentences: imperfective aspect + expected location of the event (ex: The girl was showering in the bathroom), imperfective aspect + unexpected location of the event (ex: The girl was showering in the lake), perfective aspect + expected location of the event (ex: The girl had showered in the bathroom), and perfective aspect + unexpected location of the event (ex: The girl had showered in the lake). They postulated that if verb aspects do have an effect on the recognition and use of location

information, sentences with the same level of location expectation but differ in the verb aspect would also differ in N400 amplitude. On the other hand, if verb aspects do not have such an effect, smaller N400 amplitudes would be seen for expected locations regardless of aspect. Researchers found that the amplitude did change as a result of reading a sentence with imperfective vs perfective aspects. Specifically, out of the 4 types of sentences, participants had greatest ease integrating information when the imperfective verb aspect matched the location typical to that event and greatest difficulty integrating information when the imperfective verb aspects did not match the location typical to the event. In addition, processing of sentences containing perfective aspects resulted in N400 amplitudes that did not vary significantly regardless of location expectancy. This suggests that imperfective verb aspects affect expectation of location of an event whereas perfective verb aspects do not lead to these specific expectations. Their results are also supported by findings from Morrow (1990) who found that participants were able to specifically locate a figure on the layout of a home after reading a sentence with an imperfective verb aspect (ex: John was walking from the kitchen to the bathroom). Overall, results showed that verb aspects do show expectations about where the event will occur and that they are able to constrain mental representation of the event.

In response to the second research question, we found that there were significant differences between children's performance for perfective and

imperfective aspects. Specifically, the children's performance in comprehension of imperfective aspects was significantly better than their performance in the comprehension of perfective aspects. In a study by Jia & Fuse (2007), researchers investigated the acquisition of 6 English grammatical morphemes amongst Mandarin speakers, including regular past tense verbs and the progressive –ing. They found that "–ing" was one of the first morphemes to be acquired by Mandarin speakers learning English. In addition, "ing" was the most accurately used in spontaneous speech by both children and adolescents whose L2 was English. On the other hand, the perfective –ed verbs were not mastered by any of the participants. It is possible that because "-ing" has an equivalent in Mandarin ("zai"), it is easier for Chinese English learners to acquire this morpheme. Interestingly, Davison & Hammer (2012) found that Spanish-English bilingual children mastered the perfective aspect –ed before the mastery of imperfect aspect –ing, which is different from monolingual English children. This may be because there is a parallel construct for the perfective –ed in Spanish, but there is none for the imperfective –ing. This pattern of mastery is similar to the pattern seen in Mandarin-English bilingual children, as it seems that in general, bilingual children learn features of their second language that are also found in their first language. This could also explain why our results differed from Erbaugh (1992)'s longitudinal study. Erbaugh found –le to be the most common and earliest acquired aspect marker. This difference could be due the fact that Erbaugh

worked with 4 monolingual Taiwanese children while our study focused on bilingual children. In addition, Erbaugh measured expression while our study looked at aspect comprehension, and the children were overall younger in Erbaugh's study (from 1;10 to 3;10).

Finally, in response to the third research question, with respect to age, we found that age and acquisition of event recognition in English is strongly correlated, but there is no such correlation with event recognition in Mandarin. The fact that there were significant correlations only in English is similar to Sheng's study of Mandarin-English bilingual children in 2014. She looked at the relationship between lexical-semantic skills development in bilingual children's L1 compared to children's L2 when children are immersed in an L2-dominant environment. 27 bilingual Mandarin-English children participated in the longitudinal study and were asked to do picture naming and identification tasks used to measure their receptive and expressive language. She found that both younger and older children showed growth in English vocabulary, but not in Mandarin vocabulary. At the individual level, an increase in accuracy of English tasks was seen in a majority of participants, but an increase in accuracy of Mandarin tasks was only seen in half of the participants. This difference in performance in L1 and L2 could be attributed to the fact that children experienced more immersion and more input in L2.The participants of this present study were also immersed in their L2 since they attended either daycare or school where

teachers and peers speak only English during the week, which could explain the positive relationship between age and performance in English and lack of relationship between age and performance in Mandarin. In a similar study by Uchikoshi (2014), researchers looked at L1 receptive vocabulary gains for Cantonese-English bilingual children and found that there were gains for children who were attending bilingual and monolingual schools (though there were greater gains for those who attended a bilingual school). The difference in this study's finding may be due to the fact that Uchikoshi's participants lived in California, where there is more opportunity for other sources of Cantonese input. In this present study and in Sheng (2014)'s study, children were from an area with fewer opportunities for Mandarin input outside of the home. Overall, the amount of language input (correlated with age) and L1 support within the community appears to have an effect on language performance for bilingual children.

In addition, overall, there were no significant correlations between acquisition of event recognition in Mandarin/English and experience (measured by language input and output) even after controlling for age. This is contrary to previous research that suggests that language experience is positively correlated with language use and acquisition. In the study by Sheng, Bedore, Pena, & Fiestas (2013) researchers investigated the semantic development of 60 Spanish-English bilingual children. Children were between 7;3 and 9;11 and differed in language experience (higher English experience and high Spanish experience). They found

that those who had more English experience outperformed those with more

Spanish experience in English tasks and that those who had more Spanish

experience performed better in Spanish tasks. Thus, they found that language

experience was significantly correlated with semantic knowledge and forming

semantic connections. Our results may have differed because performance on

aspect marker comprehension is not as sensitive to language input and output

compared to a larger domain of language like lexical development. In other

words, the tasks in this present study are more specific, representing a much more

constrained area of language, which could make it less sensitive to language

experience and not likely to be a direct measure of language proficiency. Another

possible reason for this lack of correlation is that for this present study, the

children's language experience is a reflection of the children's current exposure

and usage. If children had just started to attend day care or preschool, then they

may not have had sufficient time and opportunities to learn recognize these events

based on aspect markers. Davison & Hammer (2012) compared the development

of grammatical morphemes in Spanish-English bilingual preschoolers based on

the timing of English exposure. Those who were exposed to English since birth

mastered more morphemes at an earlier age compared to those who were exposed

to English after attending the Head Start program. However, after the children

attended two years of the Head Start program, both groups mastered a similar

amount of morphemes. Thus, if children in our study were recently exposed to

English or were only exposed to English for a year, they may not have mastered these morphemes yet. In the end, age was a better predictor of performance because age may appropriately reflects the totality of the child's language experience.

Limitations of this study include the small sample size (n=14), and the fact that there are other factors that contribute to language experience we did not take into account (influence of older sibling, age of acquisition of L2, etc.). Future studies need to include a large sample size to fully examine factors that may influence aspect acquisition.

Future Directions

Future studies of aspect markers in bilingual children will be useful in determining a normative standard that can be used to help differentiate those who are typically developing (TD) and those who have Specific Language Impairment (SLI). Fletcher, Leonard, Stokes, & Wong (2005) studied the expression of aspect in Cantonese-speaking children with SLI. They compared the performance of 3 groups of 15 children: preschoolers with SLI, TD age-matched peers, and typically developing younger children. They found that the children with SLI underused aspect markers compared to both typically developing peers and younger children.

Leonard et al. (2007) looked at the errors of aspect markers in English-speaking children with SLI. They compared the performance of 3 groups of 16 children: children with SLI, typically developing age-matched peers, and typically developing younger children. The children were to describe actions using either the perfective aspect –ed or the progressive aspect –ing. They found that all typically developing children showed differential usage of the two markers. The marker –ed was used with verbs that infer a clear end point (ex: drop), but the marker –ing was used with verbs that infer a continuous action (ex: play). Children with SLI, on the other hand, did not show this kind of differential usage. However, there was no significant difference between the SLI group and the younger TD group with the –ing marker. Overall, this study suggests that English-speaking children with SLI are not able to make associations between the lexical implications of the verb and the grammatical component especially in the case of –ed. Future studies of event recognition can manipulate the lexical implication of the verbs and see if accuracy would differ when the lexical aspect and the grammatical aspect are consistent with the verb versus when the two are inconsistent.

Appendix A: Parent Questionnaire

Parent Questionnaire

In this questionnaire, we are specific about the different dialects of the Chinese language, such as Mandarin, Cantonese, Shanghaiese, Taiwanese, etc. Please indicate the dialect whenever applicable.

回答问卷时, 请您尽量区分汉语的各种方言, 例如普通话, 粤语, 上海话, 台语等。

I. General Background/生活背景

Child's name/孩子姓名_____   DOB/出生年月日_____   Sex/性别_____

Child's birthplace/出生地_____   Date arriving in the US/到达美国日期_____

Grade/年级: Daycare/托儿所 Preschool/幼儿园 Kindergarten/学前班 1/一年级   2/二年级   3/三年级   4/四年级

Name of informant/填表人姓名_____   Relationship to child/与被试儿童的关系_____

Mother's name/母亲姓名_____, Age/年龄____, Birthplace/出生地_____,

Dialect/所持方言_____, Date arriving in the U.S./到达美国日期_____.

Father's name/父亲姓名_____, Age/年龄____, Birthplace/出生地_____,

Dialect/所持方言_____, Date arriving in the U.S./到达美国日期_____.

Years of education/受教育年限: father/父亲_____   mother/母亲 _____

Present Occupation/目前职业: father/父亲_____   mother/母亲_____

How well do you read and write English? Please circle one./请圈出以下符合您的英文读写能力的选项:

Father/父亲: excellent/优秀   good/良好   fair/一般   poor/较差   not at all/不具备该能力

Mother/母亲: excellent/优秀   good/良好   fair/一般   poor/较差   not at all/不具备该能力

Is the child an only child?/孩子是独生子女吗?   Yes/是__ No/否__

If not, please list the name and birthdate of the child's siblings:/如答案为否，请列出兄弟姐妹的姓名及生日:

_____

_____

_____

What other people does your household include?/是否有其他家庭成员与你们同住?

Relationship/关系_____, Age/年龄___, Dialect Spoken/所持方言_____

Relationship/关系_____, Age/年龄___, Dialect Spoken/所持方言_____

Relationship/关系_____, Age/年龄___, Dialect Spoken/所持方言_____

Has your child ever lived outside the U.S. for more than three months at a time?/孩子是否在美国之外的地方居住过三个月以上?

Yes/是__ No/否__. If yes, where, when, and for how long?/如果答案为是, 请注明时间, 地点, 及持续时间。

_____

_____

_____

II. Language Environment/语言环境

What is the primary language/dialect (language used more than 75% of the time) of communication between you and your spouse at home?/您和您的配偶在家交谈通常(75%以上的时间)用何种语言/方言?_____

Appendix A: Parent Questionnaire

What is the primary language/dialect of communication in your household?/您的家庭成员之间交谈通常(75%以上的时间)用何种语言/方言?_____

Has you child ever been enrolled in a Chinese language school?/您的孩子是否上过中文语言学校? Yes/是__ No/否__.

If yes, please indicate the following/如果答案为是, 请注明:

Name of school/学校名称_____ Location/地点 _____ Date enrolled/上学日期 _____

Has your child ever been enrolled in a bilingual school?/您的孩子是否上过中英文双语学校? Yes/是__ No/否__.

If yes, please indicate the following/如果答案为是, 请注明:

Name of school/学校名称_____ Location/地点 _____ Date enrolled/上学日期 _____

Has your child ever been enrolled in an English language school?/您的孩子是否上过英文语言学校? Yes/是__ No/否__.

If yes, please indicate the following/如果答案为是, 请注明:

Name of school/学校名称_____ Location/地点 _____ Date enrolled/上学日期 _____

Has your child ever been enrolled in an ESL (English as a second language) school?/您的孩子是否上过英语作为第二语言的语言学校? Yes/是__ No/否__. If yes, please indicate the following/如果答案为是, 请注明:

Name of school/学校名称_____ Location/地点 _____ Date enrolled/上学日期 _____

Your child watches English TV and videos/您的孩子看英文电视或录像节目的频率为:

very often/经常 __ sometimes/有时 __ occasionally/偶尔 __ never/从不 __

Your child watches Chinese TV or videos您的孩子看中文电视或录像节目的频率为:

very often/经常 __ sometimes/有时 __ occasionally/偶尔 __ never/从不 __

You and other family members read English books with your child您或您的家庭成员跟孩子阅读英文书籍的频率为:

very often/经常 __ sometimes/有时 __ occasionally/偶尔 __ never/从不 __

You and other family members read Chinese books with your child您或您的家庭成员给孩子阅读中文书籍的频率为:

very often/经常 __ sometimes/有时 __ occasionally/偶尔 __ never/从不 __

Your child plays with other English-speaking children/您的孩子与其他说英文的孩子玩耍的频率为:

very often/经常 __ sometimes/有时 __ occasionally/偶尔 __ never/从不 __

Your child plays with other Chinese-speaking children/您的孩子与其他说中文的孩子玩耍的频率为:

very often/经常 __ sometimes/有时 __ occasionally/偶尔 __ never/从不 __

Appendix A: Parent Questionnaire

III. Child Proficiency Rating/孩子语言熟练程度估测

We would like you to rate how well your child uses his or her languages. Rate the child's proficiency in each language using the following scales./请您参照以下量表给您孩子的中文和英文熟练程度分别估测。

<u>Vocabulary Proficiency</u> refers to how often the child uses home vocabulary (e.g., food or clothing names) and academic vocabulary (e.g., science terms) in each language.
<u>词汇水平</u>指的是孩子用中文或英文表达日常词汇（例如食物或衣服名称）和学术词汇（例如科学术语）的频率。

Put a check mark in the appropriate level for each language.请选择您孩子对每种语言的词汇掌握程度。

	How much English vocabulary does your child use from the words she/he learns at home (e.g., food, clothing) or school (e.g., science terms)? 在家里学的词汇（例如食物、衣服类的词）或学校里学的词汇（例如科学术语）中，您的孩子用英语表达的词汇有多少？	How much Mandarin vocabulary does your child use from the words she/he learns at home (e.g., food, clothing) or school (e.g., science terms)? 在家里学的词汇（例如食物、衣服类的词）或学校里学的词汇（例如科学术语）中，您的孩子用汉语表达的词汇有多少？
0.	Does not speak in the indicated language./不能用英语表达	Does not speak in the indicated language./不能用汉语表达
1.	A few words/几个英文词	A few words/ 几个中文词
2.	A limited range of words/ 有限范围内的英文词	A limited range of words/ 有限范围内的中文词
3.	Some words / 一些英文词	Some words / 一些中文词
4.	Many words/ 很多英文词	Many words/ 很多中文词
5.	Extensive vocabulary/ 英文词汇量很大	Extensive vocabulary/ 中文词汇量很大
	DK-　Do not know/不知道	DK-　Do not know。不知道

<u>Speech Proficiency</u> refers to how easily the child can be understood in each language.
<u>发音水平</u>指的是孩子周围的人是否能听懂孩子说话。

Check the indicated for each language in the table below. 请在每种语言下标出符合您孩子情况的选项。

	How often can you understand your child's speech in English? Difficulties in this area might be noted when a child mispronounces a sound such a /r/ or /s/, a cluster of sounds (e.g., /sk/) or omits part of a word (e.g., says "evator" for "elevator")	How often can you understand your child's speech in Mandarin? Difficulties in this area might be noted when a child mispronounces a sound such a /n/ or /l/, or omits part of a word. 您多大程度上能听懂您孩子的中文？下列情况有可能

Appendix A: Parent Questionnaire

	您多大程度上能听懂您孩子的英文？下列情况有可能对听者造成困难：例如孩子不能正确发出 /r/ 或 /s/ 音,不能连续发出两个辅音(如 /sk/) ，或漏掉单词中的部分音素(例如把"elevator" 说成"evator")。	对听者造成困难：例如孩子不能正确发出 /z, ch, sh/ 或 /r/的音，或漏掉单词中的部分音素(例如把说成 "花蝴蝶"说成"花蝶")。
0-	Does not speak in the indicated language./不能用英语表达	Does not speak in the indicated language./不能用汉语表达
1-	Never/完全听不懂	Never/完全听不懂
2-	Rarely/很少能听懂	Rarely/很少能听懂
3-	Sometimes/有时能听懂	Sometimes/有时能听懂
4-	Very often/经常能听懂	Very often/经常能听懂
5-	Always/都能听懂	Always/都能听懂
	DK- Do not know/不知道	DK- Do not know/不知道

Sentence Production Proficiency refers to the usual length of the child's sentences when he or she is conversing, responding in class, or telling a story.

句子水平 指的是孩子在对话、回答课堂问题或讲故事中所包含句子的一般长度。

Put a check mark in the level for each language. 请选择您孩子对每种语言的句子运用程度。

	How long are your child's sentences in English typically? (Remember that children commonly use sentences of a certain length but regularly use sentences that are shorter when they are answering a question such as "Would you like a cookie?" or longer than the usual length) 一般情况下您孩子说多长的英文句子？（请注意：孩子通常用一定长度的句子，但在回答例如"你想吃曲奇饼么？"这样的问题时会很简短，而在回答另外一些问题的时候所用句子会比通常情况长一些。）	How long are your child's sentences in Mandarin typically? (Remember that children commonly use sentences of a certain length but regularly use sentences that are shorter when they are answering a question such as "Would you like a cookie?" or longer than the usual length.) 一般情况下您孩子说多长的中文句子？（请注意：孩子通常用一定长度的句子，但在回答例如"你想吃曲奇饼么？"这样的问题时会很简短，而在回答另外一些问题的时候所用句子会比通常情况长一些。）
0-	Does not speak in the indicated language. /不能用英语表达	Does not speak in the indicated language. /不能用汉语表达
1-	1-2 words/1到2个词	1-2 words/1到2个词
2-	2-3 words/2到3个词	2-3 words/2到3个词
3-	3-4 words/3到4个词	3-4 words/3到4个词
4-	4-5 words/4到5个词	4-5 words/4到5个词
5-	5 or more words/5 个词以上	5 or more words/5 个词以上
	DK- Do not know/不知道	DK- Do not know/不知道

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Grammatical proficiency refers to the grammatical acceptability.

语法水平指的是语法使用的正确性。

Put a check mark in the level for each language. 请在每种语言下标出符合您孩子情况的选项。

	How often does your child produce well formed sentences in English when conversing or telling stories? Some forms that may be difficult in English are past tense forms (e.g., walk<u>ed</u>) or present tense forms (e.g., walk<u>s</u>). 在您孩子用英语交谈或讲故事时，他/她在多大程度上能运用合乎语法的句子？例如，孩子可能不能正确运用动词过去时形式（例如walked）或动词现在时形式（例如walks）。	**How often does your child produce well formed sentences in Mandarin when conversing or telling stories?** In Mandarin, children might have trouble with grammatical markers indicating the completion or ongoing status of activities. 在您孩子用汉语交谈或讲故事时，他/她在多大程度上能运用合乎语法的句子？例如，孩子可能会省略表达进行体或完成体的语法元素"妈妈很忙，妈妈洗衣服"（正确形式为"妈妈**在**洗衣服"），"宝宝吃饭了"（正确形式为"宝宝吃**完**饭了"）。
0-	Does not speak in the indicated language. 不能用英语表达	Does not speak in the indicated language. 不能用汉语表达
1-	Never/从来不能	Never/从来不能
2-	Rarely/很少能	Rarely/很少能
3-	Sometimes/有时能	Sometimes/有时能
4-	Very often/ 经常能	Very often/经常能
5-	Always/总是能	Always/总是能
	DK- Do not know/不知道	DK- Do not know/不知道

Comprehension Proficiency refers to how easily the child understands each language.

理解水平指的是孩子对每种语言的理解程度

Put a check mark in the level for each language. 请在每种语言下标出符合您孩子情况的选项

	How often does your child understand what is said in English? Difficulties in this area might be noted when she/he frequently asks for repetition or only attends to part of what you say (e.g., last part of a story, one part of a series of instructions). 您的孩子多大程度上能听懂别人说的英文？对英文话语理解有困难的行为包括：孩子经常要求您重复已经说过的话，孩子经常只听懂了一句话的前半句	**How often does your child understand what is said in Mandarin?** Difficulties in this area might be noted when she/he frequently asks for repetition or only attends to part of what you say (e.g., last part of a story, one part of a series of instructions). 您的孩子多大程度上能听懂别人说的中文？对中文话语理解有困难的行为包括：孩子经常要求您重复已经说过的话，孩子经常只听懂了一句话的前半句或后半

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	或后半句。	句。
0.	Does not understand the indicated language. 不能用英语表达	Does not understand the indicated language. 不能用汉语表达
1.	Never/从来不能	Never/从来不能
2.	Rarely/很少能	Rarely/很少能
3.	Sometimes/有时能	Sometimes/有时能
4.	Very often/经常能	Very often/经常能
5.	Always/总是能	Always/总是能
	DK-　Do not know/不知道	DK-　Do not know/不知道

Are you concerned about the way your child talks?/您对孩子的语言表达能力有担心或忧虑吗？　Yes /有　　　No/没有
If yes, please describe your concern. /如果答案为有，请描述您的忧虑。

We know that your child is exposed to English and Chinese. How important is it to you that your child be bilingual?/您孩子的成长在中英文环境下。您的孩子能否成为双语儿童对您来说：
Very important/很重要　　　　　　　Somewhat important/有一些重要　　　Not at all important/一点也不重要

Appendix A: Parent Questionnaire

IV. Language Use/语言使用 (this section will be conducted in a face-to-face interview/这部分将采用访谈形式)

At home	At School/Preschool/Daycare
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA
Mandarin, English, Both +	Mandarin, English, Both, NA

Home Language Profile/在家使用语言记录: During Week/工作日 (This should be done over for each interview/这部分)

Time/ 时间	Activity/活动	Participants/参与者	Language(s)/使用语言	
			Participant INPUT/参与者	Child OUTPUT/孩子
7am			M E B	M E B
8am			M E B	M E B
9am			M E B	M E B
10am			M E B	M E B
11am			M E B	M E B
12pm			M E B	M E B
1pm			M E B	M E B
2pm			M E B	M E B
3pm			M E B	M E B
4pm			M E B	M E B
5pm			M E B	M E B
6pm			M E B	M E B
7pm			M E B	M E B
8pm			M E B	M E B
9pm			M E B	M E B
10pm			M E B	M E B
11pm			M E B	M E B

Directions: For activity, include what the child is engaged in (e.g., breakfast, play, etc). For participants, include who is interacting with the child in the given activity (e.g., mother, grandfather, siblings, etc.). For language(s), use M for Mandarin, E for English, B for Both.

Appendix A: Parent Questionnaire

说明：活动包括孩子做的事情（例如吃早餐，玩游戏等）。参与者包括和孩子一起做事情的人（例如母亲，爷爷，兄妹等）。使用语言包括汉语（M），英语（E），汉语和英语（B）。

Home Language Profile/在家使用语言纪录: Weekend/周末

Time/ 时间	Activity/活动	Participants/参与者	Language(s)/语言 使用	
			Participant INPUT/ 参与者	**Child OUTPUT/ 孩子**
7am			M　E　B	M　E　B
8am			M　E　B	M　E　B
9am			M　E　B	M　E　B
10am			M　E　B	M　E　B
11am			M　E　B	M　E　B
12pm			M　E　B	M　E　B
1pm			M　E　B	M　E　B
2pm			M　E　B	M　E　B
3pm			M　E　B	M　E　B
4pm			M　E　B	M　E　B
5pm			M　E　B	M　E　B
6pm			M　E　B	M　E　B
7pm			M　E　B	M　E　B
8pm			M　E　B	M　E　B
9pm			M　E　B	M　E　B
10pm			M　E　B	M　E　B
11pm			M　E　B	M　E　B

Directions: For activity, include what the child is engaged in (e.g., breakfast, play, etc). For participants, include who is interacting with the child in the given activity (e.g., mother, grandfather, siblings, etc.). For language(s), use M for 汉语, E for 英语, B for 汉语和英语

说明：活动包括孩子做的事情（例如吃早餐，玩游戏等）。参与者包括和孩子一起做事情的人（例如母亲，祖父，兄妹等）。使用语言包括汉语（M），英语（E），汉语和英语（B）。

Appendix B: Aspect: Mandarin Test

句子理解

介绍：**小明／小红（小手偶）的中文不好，所以**我们要教他学中文。一会我们会看到两幅图片，阿姨会说一句话，你来告诉小明／小红哪一幅是阿姨说的图片，好吗？我们先来试一试吧。

<div>

练习1: 你能告诉小明／小红哪一幅图片是"这是长颈鹿"吗？

- 如果孩子选择了正确的图片，测试员说："真棒！现在小明／小红知道那张图片是'这是长颈鹿'啦！"
- 如果孩子只是重复句子而不选择图片，测试员说："你说得没错。但是你要告诉小明／小红阿姨说的是哪张图片"。测试员引导孩子选择一张图片。
- 如果孩子选择了错误的图片，测试员说："我觉得你指的这张图片是'这是鳄鱼'（用手指相应图片）。那张图片画的才是'这是长颈鹿'（用手指相应图片），你觉得我说得对吗？我们再告诉小手偶一次哪张图片画的是'这是长颈鹿'"，好吗？

</div>

练习2和练习3同练习1。

3个练习结束后，测试员说："你真棒！我们再看一些图片，你就像刚才那样，根据我说的话帮助小明／小红找出正确的图片"。

以下是所有的句子（包括练习）：

练习：

Practice 1. 你看，这是长颈鹿。 (B)　　　　　　　　回答:_____
Ni3 kan4, zhe4 shi4 chang2 jing3 lu4.
Practice 2. 你看，小男孩和小女孩在种树。(A)　　　　回答:_____
Ni3 kan4, xiao3 nan2 hai2 he2 xiao3 nv3 hai2 zai4 zhong4 shu4.

测试题目：所有回答均被接受，无过多评价。
(1) 你看，叔叔游了泳。(B)　　　　　　　　　　回答:_____

Ni3 kan4, shu1 shu you2 le yong3.

(2) 你看，小男孩在喂小鸡。（A）　　　　　　　回答:_____

Ni3 kan4, xiao3 nan2 hai2 zai4 wei4 xiao3 ji1.

(3) 你看，叔叔在上楼。(A)　　　　　　　回答:_____

Ni3 kan4, shu1 shu zai4 shang4 lou2.

(4) 你看，爷爷抱着猫。(B)　　　　　　　回答:_____

Ni3 kan4, ye2 ye bao4 zhe mao1.

(5) 你看，老奶奶在撕一张报纸。(B)　　　　　　　回答:_____

Ni3 kan4, lao3 nai3 nai zai4 si1 yi4 zhang1 bao4 zhi3.

(6) 你看，绳子断了。(B)　　　　　　　回答:_____

Ni3 kan4, sheng2 zi duan4 le.

(7) 你看，猴子在翻跟头。(B)　　　　　　　回答:_____

Ni3 kan4, hou2 zi zai4 fan1 gen1 tou.

(8) 你看，小女孩吃着西瓜。(A)　　　　　　　回答:_____

Ni3 kan4, xiao3 nv3 hai2 chi1 zhe xi1 gua.

(9) 你看，小男孩喝了一杯水。(A)　　　　　　　回答:_____

Ni3 kan4, xiao3 nan2 hai2 he1 le yi4 bei1 shui3.

(10) 你看，裙子没有破。(B)　　　　　　　回答:_____

Ni3 kan4, qun2 zi mei2 you po4.

(11) 你看，叔叔挂了一张画儿。(A)　　　　　　　回答:_____

Ni3 kan4, shu1 shu gua4 le yi4 zhang1 hua4.

(12) 你看，老奶奶拿着雨伞。(A)　　　　　　　回答:_____

Ni3 kan4, lao3 nai3 nai na2 zhe yu3 san3.

(13) 你看，叔叔在跑步。(B)　　　　　　　回答:_____

Ni3 kan4, shu1 shu zai4 pao3 bu4.

(14) 你看，叔叔踢了那头猪。(A)　　　　　　　回答:_____

Ni3 kan4, shu1 shu ti1 le na4 tou2 zhu1.

(15) 你看，小男孩画了一只小猫。(B)　　　　　　　回答:_____

Ni3 kan4, xiao3 nan2 hai2 hua4 le yi4 zhi1 mao1.

(16) 你看，小女孩拿着气球。(B)　　　　　　　回答:_____

Ni3 kan4, xiao3 nv3 hai2 na2 zhe qi4 qiu2.

(17) 你看，老爷爷在削一根铅笔。(A)　　　　　　　回答:_____

Ni3 kan4, lao3 ye2 ye zai4 xiao1 yi4 gen1 qian1 bi3.

(18) 你看，小女孩搭了一个房子。(B)　　　　　　回答:_____

Ni3 kan4, xiao3 nv3 hai2 da1 le yi2 ge4 fang2 zi.

(19) 你看，箱子开着。(A)　　　　　　　　　　　回答:_____

Ni3 kan4, xiang1 zi kai1 zhe.

(20) 你看，小女孩在吹一根蜡烛。(A)　　　　　　回答:_____

Ni3 kan4, xiao3 nv3 hai2 zai4 chui1 yi4 gen1 la4 zhu2.

Sentence Comprehension

Instructions: Emily/David (the puppet) is learning English. He/she can't understand much English. Let's teach him/her by looking at pictures! I will say a sentence and show you two pictures. I want you to point to the picture which goes with the sentence and show it to Emily/David. Let's practice first.

Practice one: Can you tell me which picture is "This is a granny"?
- If the child picks the correct picture, say "Good job! Now Emily/David knows which picture shows "This is a granny".
- If the child repeats the sentence without picking a picture, say "You are right. But remember that you must show Emily/David which picture goes with the sentence", and prompt the child to pick one picture.
- If the child points to the wrong picture, say "I think this picture tells *"This is granpa"* (point to the corresponding picture). The other picture shows *"This is a granny"* (point to the corresponding picture). What do you think? Now tell Emily/David again which picture shows "This is a granny".

After the practice, say "You are doing a great job helping Emily/David. Now you are going to listen to more sentences. Remember, you will listen to the sentence and pick a picture from two to help Emily/David learn English."

Practice items:

Practice 1. Look, this is a granny. (A)   Response:_____

Practice 2. Look, the boy is riding a horse. (B)   Response:_____

Test items:

Sentences are accepted without further comment.

(1) Look, the plate is broken. (B)   Response:_____

(2) Look, the girl walked a dog. (B)   Response:_____

(3) Look, the strawberry is on the plate. (A)   Response:_____

(4) Look, the man is walking. (A)   Response:_____

(5) Look, the old man is wearing a hat.(A)   Response:_____

(6) Look, the boy is reading a book. (A)   Response:_____

(7) Look, the girl drank some juice.(B)   Response:_____

(8) Look, the ice cream melted. (A)   Response:_____

(9) Look, the boy is drinking water. (B)   Response:_____

(10) Look, the big frog jumped. (B)   Response:_____

(11) Look, the dog is sleeping. (A)   Response:_____

(12) Look, the boy built a house. (A)   Response:_____

(13) Look, the boy is holding a flower.(A)   Response:_____

(14) Look, the tree did not fall down. (B)   Response:_____

(15) Look, the girl drew a flower. (B)   Response:_____

(16) Look, the man is eating an apple. (B)   Response:_____

(17) Look, the girl ate a banana. (A)   Response:_____

(18) Look, the granny is planting a flower. (A)   Response:_____

(19) Look, the bottle fell down. (B)   Response:_____

(20) Look, the girl is carrying a bucket of water. (B)   Response:_____

REFERENCES

Adrian, P., Chen, X., Lam, K., Luo, C. Y., & Ramirez, G. (2011). Cross‑language

transfer of morphological awareness in Chinese-English bilinguals.

Journal of Research in Reading 34(1): 23–42.

Alhawary, M. T. (2009). The Acquisition of Texas/Aspect and Verbal Agreement.

In *Arabic Second Language Acquisition of Morphosyntax*. New Haven,

Connecticut: Yale Univ. Press.

Altmann, Y. K. (1999). Incremental interpretation at verbs: restricting the domain

of subsequent reference. *Cognition,* 73 (1999), 247–264.

Altmann, G.T.M., & Kamide, Y. (1999). Incremental interpretation at verbs:

Restricting the domain of subsequent reference. *Cognition, 73*(3), 247-

264.

Andersen, R. W. & Shirai, Y. (1996). Primacy of aspect in first and second

language acquisition: The pidgin/creole connection. In *W. C. Ritchie & T.

K. Bhatia (Eds.), Handbook of second language acquisition* (pp. 527-570).

San Diego, CA: Academic Press.

Basden, B. H., Bonilla-Meeks, J. L., & Basden, D. R. (1994). Cross-language

priming in word-fragment completion. *Journal of Memory and Language*,

33, 69–82.

Bedore, L. M. & Peña, E. D. (2008) Assessment of bilingual children for

identification of language impairment: Current findings and implications

for practice. *International Journal of Bilingual Education and

Bilingualism*, *11*(1), 1-29.

Chen, J., & Shirai, Y. (2010). The development of aspectual marking in child

Mandarin Chinese. *Applied Psycholinguistics, 31*, 1-1.

Colome, A. (2001). Lexical activation in bilinguals' speech production:

Language-specific or language independent? *Journal of Memory and

Language*, 45, 721–736.

Davison, M., & Hammer, C. (2012). Development of 14 English grammatical

morphemes in Spanish–English preschoolers. *Clinical Linguistics &

Phonetics, 26*(8), 728-742.

Erbaugh, M. (1992). Acquisition of Mandarin. In *The Crosslinguistic Study of

Language Acquisition* (Vol. 3, pp. 373-443). Hillsdale, New Jersey:

Lawrence Erlbaum Associates.

Ferretti, T., Kutas, M., & Mcrae, K. (2007). Verb aspect and the activation of

event knowledge. *Journal of Experimental Psychology: Learning,

Memory, and Cognition, 33*(1), 182-196.

Fletcher, P., Leonard, L., Stokes, S., & Wong, A. M.-Y. (2005). The expression of

aspect in Cantonese-speaking children with specific language impairment.

Journal of Speech, Language, and Hearing Research, 48, 621–634.

Gawlitzek-Maiwald, I. & Tracy, R. (2009). Bilingual bootstrapping. *Linguistics*, *34*(5), 901-926.

Gillette, J., Gleitman, H., Gleitman, L., & Lederer, A. (1999). Human simulation of vocabulary learning. *Cognition*, 73, 135–176.

Grech, H., & Dodd, B. (2008). Phonological acquisition in Malta: A bilingual language learning context . *International Journal of Bilingualism, 12*, (3): 155-17.

Gutiérrez-Clellen, V. F., & Kreiter, J. (2003). Understanding child bilingual acquisition using parent and teacher reports. *Applied Psycholinguistics, 24,* 267–288.

Hammer, C. S., Lawrence, F. R., & Miccio, A. W. (2008). Exposure to English before and after entry to Head Start: Bilingual children's receptive language growth in Spanish and English. *International Journal of Bilingual Education and Bilingualism, 11,* 30–56.

Hartsuiker, R., Pickering, M., & Veltkamp, E. (2004). Is Syntax Separate or Shared Between Languages? *Psychological Science, 15*(6), 409-414.

Herschensohn, J., Stevenson, J., & Waltmunson, J. (2005). Children's acquisition of L2 Spanish morphosyntax in an immersion setting. *IRAL - International Review of Applied Linguistics in Language Teaching, 43*(3), 193-217.

Huang, Chiung-chih. (2006). Child language acquisition of temporality in

Mandarin Chinese. *The Handbook of East Asian Psycholinguistic*, *1*, 52-60. Cambridge, UK: Cambridge University Press.

Jia, G. & Fuse, A. (2007). Acquisition of English Grammatical Morphology by Native Mandarin-Speaking Children and Adolescents: Age-Related Differences *Journal of Speech, Language, and Hearing Research*, October 2007, Vol. 50, 1280-1299.

Konstantzou, K., van Hout, A., Varlokosta, S., & Vlassopoulos, M. (2013). Perfective - imperfective. *Linguistic Variation*, *13*(2), 187-216.

Kroll, J. F., Bobb, S., & Wodniecka, Z. (2006). Language selectivity is the exception, not the rule: Arguments against a fixed locus of language selection in bilingual speech. *Bilingualism: Language and Cognition, 9*, 119-135.

Leonard, L. (2014). Specific Language Impairment Across Languages. *Child Development   Perspectives, 8*(1), 1-5.

Leonard, L., Deevy, P., Kurtz, R., Chorev, L., Owen, A., Polite, E., & ... Finneran, D. (2007). Lexical aspect and the use of verb morphology by children with specific language impairment. *Journal Of Speech, Language & Hearing Research*, *50*(3), 759-777.

Li, P., & Bowerman, M. (1998). The acquisition of lexical and grammatical aspect in Chinese. *First Language, 18*, 311-350.

Loebell, H., & Bock, K. (2003). Structural priming across languages. *Linguistics, 41*, 791-824.

Luo, Y. C., Chen, X., & Geva, E. (2014). Concurrent and Longitudinal Cross-Linguistic Transfer of Phonological Awareness and Morphological Awareness in Chinese-English Bilingual Children. *Written Language & Literacy, 17,* 89-115.

Madden, C., & Zwaan, R. (2003). How does verb aspect constrain event representations? *Memory & Cognition, 31*(5), 663-672.

Marian, V., & Kaushanskaya, M. (2007). Cross-linguistic transfer and borrowing in bilinguals. *Applied Psycholinguistics, 28*(2).

Martelle, W. (2011). Testing the Aspect Hypothesis in L2 Russian. Doctoral dissertation, University of Pittsburgh, Pittsburgh, Pennsylvania. (Publication No. AAT 3485756).

Min, W., Cheng, C., & Chen, S. (2006). Contribution of morphological awareness to Chinese-English biliteracy acquisition. *Journal of Educational Psychology* 98(3): 542–553.

Morrow, D. G. (1990). Spatial models, prepositions, and verb-aspect markers. *Discourse Processes, 13,* 441–469.

Restrepo, M. A. (1998). Identifiers of predominantly Spanish- speaking children with language impairment. *Journal of Speech, Language, and Hearing Research, 41,* 1398-1411.

Sheng, L. (2014). Lexical-semantic skills in bilingual children who are becoming English-dominant: A longitudinal study. *Bilingualism: Language and Cognition*, 17, pp 556-571.

Sheng, L., Bedore, L., Peña, E., & Fiestas, C. (2013). Semantic Development in Spanish-English Bilingual Children: Effects of Age and Language Experience. *Child Development, 84*(3), 1034-1045.

Shirai, Y. (1994). On the overgeneralization of progressive marking on stative verbs: Bioprogram or input? First Language, 14, 68–82.

Shirai, Y., & Li, P. (2000). *The acquisition of lexical and grammatical aspect* (Vol. 16). Walter de Gruyter.

Stokes, S.F. and Fletcher, P. (2003) Aspectual forms in Cantonese children with specific language impairment. *Linguistics* 41, 381-406.

Uchikoshi, Y. (2014). Development of vocabulary in Spanish-speaking and Cantonese-speaking   English language learners. *Applied Psycholinguistics,35*, 119-153.

Zhou, P., Crain, S., & Zhan, L. (2014). Grammatical aspect and event recognition in children's online sentence comprehension. *Cognition,133*(1), 262-276.