Different Behaviors of Wh-words in Chinese Wh-question Acquisition by Deaf Students

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Abstract. Chinese acquisition by deaf students is a crucial and tough problem. In this study, we have chosen wh-question as a target structure and examined the behaviors of wh-words in Chinese wh-question acquisition by fifty-eight deaf students. The main findings of this study are displayed as follows. The overall performance wh-question acquisition by deaf students is poor. Based on the behaviors of wh-words, it is quite obvious that the acquisition order of the wh-words is as follows: What >> who > where > when >> how. The pedagogical implications for the teachers and learners are to pay attention to their Chinese wh-question teaching and learning.

Introduction

It is estimated that for every one thousand children born in China, approximately two to three are identified with hearing impairment. China Disabled Persons Federation website (2017) illustrates that there are about 2.53 million persons with hearing disability in China. Among them, there are 57.9 thousand persons with speech disability and they distribute in different regions with different rehabilitation services (See Figure 1).

Figure 1. Persons with HD and Persons with SD in China.

Their obstacles are language barriers when they communicate hearing people. A tough question in research on language development of deaf people is how they approach the acquisition task with the restricted input, due to their hearing loss. The language development of deaf children has been consistently shown to be delayed with or lagged behind their typically developed hearing peers (Wilbur, Goodhart & Montandon 1983; Lillo-Martin 1998; Friedmann & Szterman 2006, 2011). Many deaf children often have either late or limited exposure to oral language because of their hearing impairment. Severely and profoundly deaf learners of Chinese, for example, generally acquire Chinese at a much slower rate than hearing learners of Chinese do, and they experience persistent difficulty on many basic Chinese syntactic structures (Yang, 2002; Liu, 2013; Zheng, 2004). How to improve the efficiency of deaf people's language learning is the endless debates. Since the beginning of deaf education, the dispute focus on what kind of communication is the most effective to them and what is they should study.

There has been oral communication, sign communication, integrated communication, and bilingual communication in the world. In 1880, Milan Deaf Education Conference legalized their language
learning which becomes trend. In China what kind of communication they should be influenced by foreign advanced theory. But we always step behind those countries. Advocating oral communication became main idea in recent deaf education. For the influence of sign language on mainstream language acquisition, there exist some controversial issues. Some researchers found that deaf people who are skilled in sign language do better in reading than deaf people who are not (Kathy N. Andrew, 2014; Debra Nussbaum, 2012). However, many parents believe that sign language will only inhibit their child’s ability to speak and therefore see signing as a bad influence and have forbidden their children to associate with others in the deaf community. As a result of this kind of upbringing, many deaf people have difficulty coming to terms with their deaf identity and often look down upon deaf people. Many deaf students would prefer a hearing teacher to a deaf one as a result of this stigma. There are no role models to look up to for no famous deaf people are known within China. Deaf people in China commonly try to integrate with the mainstream and do not want to be associated with the deaf community.

The current status of sign language is as an educational tool to learn the Chinese language and transmit the curriculum. It is not used or taught as a separate language in its own right in formal education in deaf schools. At the moment students with moderate hearing losses are unable to access this route into mainstream society and are educated in deaf schools. Lack of early exposure to language, most children start deaf school at age seven or later. Teachers in deaf schools focus on problem in children’s language development and their ability to become self-supporting on leaving school.

This study examines the acquisition of Chinese wh-questions by deaf students in order to extend our understanding of the difficulty/interference of language acquisition. Specifically, we adopt a bimodal bilingual perspective to study if, and if so how, proficiency in sign language influences wh-question comprehension. The focus of this study will mainly be the acquisition of wh-questions by deaf children, but considering that these subjects have received both signed and spoken language input in the school of special education, the possible influence of sign language through language contact or transfer will also be taken into account in our analysis of the developmental processes. What different behaviors of wh-words have in acquiring Chinese wh-questions by deaf students? According to the research question, the following predictions can be made. Sign language plays an important role in the deaf students’ Chinese wh-questions acquisition. It can facilitate acquisition process although it has some negative transfer on deaf students’ Chinese wh-questions acquisition.

**Wh-questions in English, Chinese and Chinese Sign Language**

Wh-questions are questions headed by wh-words, such as who, what, when, where, and so forth. There are two major linguistic differences between English and Chinese wh-questions. A study of L2 English-speaking learners’ acquisition of Chinese wh-questions can make an interesting contribution to the L2 acquisition theories. One difference is that in wh-questions, English words are fronted to sentence initial positions, while Chinese wh-words remain in-situ, i.e., in the position where they originated in the deep structure, as shown by the English and Chinese sentences in (1).

That is why traditionally English is categorized as a movement language and Chinese is categorized as a wh-in-situ language. In indirect questions, as shown by (2) a, and in wh-questions in object complement, as shown by (2) b, the same syntactic difference remains for English and Chinese. For easy reference, in this dissertation the author will call the latter two types of wh-questions complex wh-questions. All natural languages have ways of phonetically representing wh-words, but these wh-words have different syntactic properties cross linguistically. The main difference is drawn between wh-movement and wh-in situ.

In English, wh-questions are questions with wh-words (e.g., what, when, where, which, who(m), whose, why or how) requesting specific information, and the circumstances surrounding actions and events. Wh-words have to move to the initial position of the sentences. In Chinese, the wh-words of wh-questions remain in situ, as shenme (what) in (1).
(1) Ni xihuan chi shenme?
   you like eat what Q
   ‘What would you like to eat?’

All English sentences in the deep structure follow the canonical order SVO(Subject-Verb-Object) in their most basic affirmative forms. All other forms, such as negative, interrogative, passive, etc. are derived from the deep structure. When a WH-question is derived from the deep structure in English, it goes through three different steps, Do-support, Subject-auxiliary inversion, and WH-movement, before it gets to the Affix Hopping stage. In contrast, the Chinese counterpart skips all three different derivations that we see in its English counterpart.

In English, wh-words can be analyzed as argument and adjunct. However, wh-words in Chinese wh-questions behave differently (Cheng, 1991; YUAN, 2007). Chinese wh-words with the [+nominal] feature, such as the Chinese equivalents of who, what, when, where and how, do not have an operator, whereas the Chinese wh-adverb weishenme “why” has an operator, which has to raise to CP for feature checking. We are aware that nar “where” can be used as an argument in Chinese when verbs like “put” are used. However, as it is generally used as a non-argument elsewhere, we group nar “where” with shenmeshihou “when” and zemeyang “how”.

Chinese sign language (CSL) is a visual language and its basic word order of wh-questions is SOV (subject+object+Verb). The topic is always prominent and wh-words are always at the end of the sentences.

(2) Chinese : ni jiao shenme mingzi?
    CSL : ni/ mingzi/ shenme?
    English: you name what

Wh-question Acquisition in the Hearing-impaired (HI) Children

The majority deaf children are born to hearing families who typically do not use a sign language, instead focusing on teaching the child spoken language. Such an approach has had typically highly variable outcomes. Spoken language acquisition, if it does occur, is significantly delayed in many deaf children compared to hearing children, depending not only on the degree and kind of hearing loss but also the child’s home and school environments, their intelligence and time spent reading (Blamey, 2003).

Generally speaking, reading and language academic achievements of deaf and hard-of-hearing students have been lower than their typically developing hearing peers. Language acquisition is seen as the most difficult problem for the hearing impaired children. Studies of late talkers and children with SLI who speak other languages, such as German, Italian, and Spanish, have found lower frequencies of morphological deficits than their English peers (Leonard & Bortolini, 1998; Lindner & Johnston, 1992). Thus, associations between the lexicon and the grammar for children with limited language ability may vary across languages. Mayberry and Lock (2002) showed that their adult participants (hearing and deaf) who acquired a language early in life performed significantly better on English (L2) grammatical judgment tasks and picture sentence comprehension tasks than deaf individuals without the experience of accessible language early in life. Their results show that deaf and hearing individuals with early language experience, who began learning English as L2 before the age of nine. Three previous studies assessed Wh-questions in individuals with hearing loss (Berent, 1996; Quigley, Wilbur, & Montanelli, 1974); the two that tested comprehension of Wh-questions were only in the written modality. These studies report difficulty in the comprehension of Wh-questions by DHH English speakers. Quigley, Smith, et al. (1974) tested questions in 420 DHH English speakers aged 10–19 years. The study tested the comprehension of yes/no questions, Wh-questions, and tag questions using written tasks: answering questions, grammaticality judgment, and rewriting sentences. The results of Quigley, Smith, et al.’s study indicated difficulty in question comprehension and in judging the grammaticality of questions. There was a steady increase with age in the comprehension of all three question types. However the DHH children did not show mastery of
Wh-questions even in the older ages tested and were only able to reach normal performance on yes/no questions, but still in a much later age than hearing children. Although Quigley, Smith, et al.’s study was very broad, it did not examine the ability of the DHH children to interpret semantically reversible Wh-questions and assign the thematic roles to the noun phrases (NPs) in the question. The study that examined Wh-questions was conducted by Berent (1996). Berent tested written production and grammaticality judgment of questions in English-speaking DHH college students and found that despite years of exposure to English language input, Wh-questions were still not mastered by the DHH students. Subject questions were produced and judged better than object question.

Whether or not spoken language proficiency is successfully attained, some degree of proficiency in the surrounding spoken language via reading and writing can be achieved by some deaf individuals. However, such successes with literacy are again highly variable and not common. Regardless of their success or failure to acquire spoken or written language, many deaf individuals from non-signing families may begin to use a sign language. This may occur only later in childhood when they encounter signing in school, or even much later after having left school. Some of these individuals can be considered to have delayed acquisition of a sign language as L1. However, many deaf individuals have some degree of proficiency in the surrounding spoken language, so determining true cases of delayed L1 acquisition of a sign language, as opposed to second language (L2) acquisition of a sign language after successful acquisition of the surrounding spoken/written language as L1, can be a challenge. However, as noted above, cases of delayed first language acquisition of a spoken language are rare and confounded with other variables. Deaf individuals acquiring a signed language at varying ages provide a better testing ground for hypotheses about L1 critical periods.

Many parents of deaf children spend tens of thousands of yuan on various types of treatment to cure the deafness. As a result of this kind of upbringing, many deaf people have difficulty coming to terms with their deaf identity and often look down upon deaf people. Many deaf students would prefer a hearing teacher to a deaf one as a result of this stigma. There are no role models to look up to for no famous deaf people are known within China. Deaf people in China commonly try to integrate with the mainstream and do not want to be associated with the deaf community.

Methodology
In this part, we will describe the experiment thoroughly. First, participants, materials, and procedures are detailed. In this way, we can be certain that any difference in the participants’ judgments of the corresponding experimental sentences is due to the difference in the use of wh-words in the sentences.

Participants
They are 18 typically developing children (henceforth TD, 9 boys and 9 girls; age range: 8—10, M=8.8) with no sign language background, no learning disabilities, or with no speech or hearing problems. TD are from Grade two of Wangxin Primary School, Changsha, Hunan. No participants reported to be diagnosed with any language or reading disorders.

Fifty-eight deaf students of Chinese participated in the experiment. Deaf participants were selected from Changsha Special Education School in Hunan province. Participants for the present study were selected on the basis of having been recorded in their birth certificates. Participants were for the most part clearly prelingually deaf (49 reported being deaf from birth; 3 reported becoming deaf before age 3, and 3 reported becoming deaf between ages 3 and 5). All participants reported severe or profound hearing loss. All participants reported that they use sign language every day as their preferred language and that they had been using sign language for 10 years or more at the time of testing.

Deaf students will be excluded when they fail to ask at least two questions during the test. Before the experiment, the experimenters have been in the class playing with the participants for two days, so that the students would not feel embarrassed or shy in communicating with the experimenters. All participants are tested individually in a room separated from the classroom in the special school so that they would not be distracted.
**Materials**

The participants first took grammaticality judgment test. The participants were provided with similar but unrelated example sentences illustrating two items with regard to degrees of grammaticality. The participants were instructed that no vocabulary errors and semantic problems existed in the sentences and main attention should be paid to the sentence structure. In addition, the students could go back to the previous items to change answers. This task session took about 20 minutes, including 5 minutes for instruction and the other 15 minutes on the actual grammaticality judgment tests.

**Procedure**

The procedure was explained to the participants, followed by a practice session of eight sentences, including four grammatical sentences and their four ungrammatical counterparts. In the actual experiment, the 30 sentences were presented and were individually randomized. Participants were instructed to judge whether the sentence appeared to them to be acceptable or not by paying attention to features such as word order, wh-movement or not. They were also told to respond quickly but carefully.

**Results and Discussion**

In the study, we will focus on the children's comprehension of wh-questions and see acquisition order of wh-words by the participants in our pilot study. The participants in this study produced 66 wh-questions: 34 argument wh-questions (16 subject wh-questions and 18 object wh-questions) and 32 adjunct wh-questions (8 where questions, 7 when-questions, 8 why-questions, 9 how-questions).

It is quite obvious that the acquisition order of the wh-words is as follows:

- What >> who > where > when >> how. This is acceptable because it is also the order of the complexity of wh-words in Chinese. The data were analyzed using a mixed ANOVA design in SPSS 23.0 to identify the interaction within and across the two language groups in terms of sign proficiency.

The results of multiple comparisons by LSD show that at 95% confidence level, deaf students have significantly lower acquisition of wh-words than others as follows: who < what, p = 0.017 < 0.05; who < which, p = 0.012 < 0.05; who < when, p = 0.001 < 0.05; where < when, p = 0.049 < 0.05; why < when, p = 0.011 < 0.05; how < when, P = 0.025 < 0.05. The acquisition of who-questions is significantly lowest of others (P = 0.001).

The present study is an investigation of wh-question acquisition by Chinese deaf students. The analysis is made on the two aspects: overall performance and behaviors of wh-words by deaf students. Through the analysis, how wh-words different from one another are investigated. In this study, based on the research question, discussions from the two aspects are given: general situation and different behaviors of wh-words in wh-question acquisition. The correction percentage of wh-question production is lower than that of the typically developed children, with great significant difference by statistical analysis. Just as our previous prediction, the deaf students have great difficulty in acquiring wh-questions. The acquisition of wh-question is an important part of Chinese in deaf students.

The nature of the Chinese learning of the deaf is a second language learning. The transfer will occur when learning a second language, similar features of the two languages lead to the positive transfer and different features of the two give rise to the negative transfer. In the context of the current study, we will focus on those deaf children who receive signed language input from either their parents, peers or teachers (if signed language is available at school), in addition to oral language input. The co-existence of both signed and spoken language input in the learning environment may bring about bi-directional transfer, meaning that the linguistic resources of one grammar can be transferred to the other grammar in their developing knowledge (Tang, 2011).

Tang (2011) explained that deaf children are constantly entertaining two developing grammars at any point in their language development and they may draw on resources from the two grammars to ‘co-construct’ a target structure. But we can concluded from the study that different behaviors of wh-words acquisition are partly due to sign language influence. We find that the deaf students will...
acquire wh-words differently in their production. Wh-words in Chinese wh-questions have comparatively different complexity which contributes to some difficulties of acquisition by deaf students.

**Conclusion**

In this study, Chinese wh-question production test was conducted among the deaf children with sign language, and the results showed significant effect in different wh-words. Children with better sign language skills had better production of wh-questions. We have examined the behaviors of wh-words in Chinese wh-question acquisition by deaf students. The main findings of this study are displayed as follows. The overall performance wh-question acquisition by deaf students is poor. Based on the behaviors of wh-words, it is quite obvious that the acquisition order of the wh-words is as follows: What >> who > where > when >> how. The pedagogical implications for the teachers and learners are to pay attention to their Chinese wh-question teaching and learning.

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