

The Impact of Bilingualism on the Metalinguistic Awareness Developments of ASL-English  
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### Introduction

For the past decades, the discussion of whether bilingualism leads to cognitive advantages which are not shared by monolinguals have been seen on many psycholinguistic studies. Some of the studies focus on studying bilingual children's divergent thinking ability, some studies analyze the differences on metalinguistic abilities between bilingual children and the monolingual ones, while the others explore their language developments such as lexical acquisition. In review of these past literature on the effects of bilingualism on cognitive developments, I discovered that most of the bilingualism studies conducted experiments with children who are proficient in speaking languages, and few studies were found in which their participants are bilingual hearing children who are proficient in a sign language along with another speaking language. Though American Sign Language (ASL) does not contain a sound system like other speaking languages, it contains all fundamental features of a language. It contains its own set of grammar: the sound system—phonology (is replaced by gestures), morphology, syntax, and semantics. And past research has found that 90% of deaf parents have hearing children (Mitchell & Karchmer 2004). These families' bridges the divide between the hearing and deaf worlds, the progress of cognitive development of those hearing children might be different comparing other bilingual children. Secondly, I found that most of bilingualism studies focus on bilingual children who are fully proficient in both languages, and few studies have researched on the effects of partial bilingualism. It would be interesting to examine the relationship between the degree of the children's bilingualism and their performances on some of the tasks that were used in past research studies on cognitive developments.

To address the two research gaps I mentioned above, I propose to examine the effects of differing degrees of bilingualism on the metalinguistic abilities of ASL-English hearing children. In this study, there will be three linguistic groups of children (fully bilingual, partial bilingual and monolingual) participating in experiments which aims to examine their word awareness, syntactic awareness, and phonological awareness. My hypothesis is that fully ASL-English bilingual children will have the best word and syntactic awareness, followed by partial ASL-English bilingual children, and monolingual children in English will have the weakest word and

syntactic awareness out of these three linguistic groups. And the phonological awareness of all three linguistic groups will be on the same level.

### **Background**

There are several metalinguistic tasks that were used to measure children's different metalinguistic abilities in past studies. For instance, Ben-Zeev (1977) examined bilingual Hebrew-English children's word awareness using tasks involving "symbol substitution". One task that the researcher administered was a task asking children to construct grammatically-violated sentences according to the direction of the researchers. For example:

*Researcher: if 'they' means 'spaghetti', how do we say 'They are good children'?*

The researcher found that bilingual children outperformed Hebrew monolinguals on such task, and that bilingual children were more willing to accept the new meaning of the word, while monolingual children were more wedded to the original meaning of the word. These findings hints that bilingual children was better at understanding the idea that the structures of language is different from its phonological representations.

Similar studies such as Feldman & Shen (1971) found that while both Spanish-English bilingual children and English monolingual children were able to learn new names for things (some of the new names are real names while other were non-existed words) equally well, only the bilingual children were successful in using those newly-taught names in sentences.

Though many of the studies concerning bilingual word awareness have findings favor the bilingual performances, there are studies in which their results that do not favor bilinguals. For example, the results from Rosenblum & Pinker (1983) found no performance in differences between Hebrew-English bilingual children and Hebrew monolingual children in their ability to substitute nonsense words for the actual words. Furthermore, Gathercole (1997) used a judgment task to examine whether Spanish-English bilingual children could cues to distinguish mass nouns from count nouns. The results from such task showed that the older the more fluent bilingual children performed equally well as monolinguals, but that the younger, and less fluent bilingual children performed worse than monolinguals as the same age.

Bialystok (1998) also suggests that bilingual children process a more developed syntactic awareness. To test her hypothesis, Bialystok designed a task in which children were asked to make judgments to four types of sentences. The first type were sentences that were both grammatical and meaningful, e.g. "the dog barks". The second type were sentences which are

ungrammatical but meaningful, e.g. “the dog bark”. The third type were sentences which were grammatical but not meaningful, e.g. “the dog meows”. And the forth type were sentences that were neither grammatical nor meaningful, e.g. “the dog meow”. The results of such experiment shows that bilingual children were able to make better grammatical judgments. Such result indicates that bilingual children were more aware to syntactic differences than their monolingual peers.

Galambos and Goldin-Meadow (1990) is a similar study to Bialystok (1998). In Galambos and Goldin-Meadow’s study, they presented Spanish-English bilingual children and their monolingual counterparts with metalinguistic tests consisted of ungrammatical constructions, and grammatically correct “filters”. For each construction, children were asked in the appropriate language to note any errors, correct them, and explain why those errors were incorrect. The researchers found that Spanish-English bilingual children detected more grammatical errors than monolingual children from either language. In addition, the younger bilingual participants (preschool age) gave more structure-based explanations and less content-based explanations than the monolingual children. These results show that bilingual children were process a more developed syntactic awareness than their monolingual children, and they were able to develop such awareness in a younger age.

Studies have also found that bilingual children process more advanced phonological awareness than monolingual children. In a study by Campbell & Sais (1995), researchers conducted four tasks to examine the phonological awareness of Italian-English bilingual children (5 year-old) who at least had one Italian parent. The four tasks include: detecting a mismatch in initial sound of words, detect a mismatch in meaning, detect morphemes from words, and identifying letters. The bilingual children outperformed their monolingual peers in the first three task, while both bilingual and monolingual children performed equally well in the identifying letters task.

Similar findings were also concluded from Rubin & Turner (1989)’s experiments. In their experiments, experimenters gave phonological awareness tests, which included syllable counting task and phoneme counting tasks, to French-English bilinguals and English monolinguals who are either in kindergarten or first grade. Their findings indicated that bilinguals performed better at the syllable counting task, while monolinguals performed better at the phoneme counting task.

Yelland, Pollard, and Mercury (1933) also studied the phonological awareness of partial bilingual Italian-English children. In their experiments, partial bilinguals and monolinguals were shown a number of objects in pictures, and were asked to judge whether those pictures contained long or short names. The results showed that partial bilinguals outperformed their monolingual peers in this task, hints bilinguals process phonological advantages over monolinguals. Not only does this positive finding contributes to the phonological awareness of bilingual children, it also supports my hypothesis that even a slight exposure to a second language can have a positive influence in some cognitive developments.

### **Logic**

From all the studies mentioned above, one can conclude three major types of tasks examining the three different metalinguistic awareness. To examine the word analysis, researchers commonly use word-replacement tasks to test children's ability to recognize the arbitrary relation between words and their assigned meanings. To examine the syntactic awareness, grammatical identifying task is commonly used, while to examine phonological awareness, phonological tasks such as syllable counting, and detecting mispronunciation tasks are used.

My hypothesis in which children who are fully bilingual in both ASL and English will process the most developed metalinguistic abilities: word awareness, syntactic awareness; and children whose native language is English, and have been exposed to ASL will have the second most developed metalinguistic abilities in word awareness and syntactic awareness out of the three linguistic groups; while monolingual children who only speak English will have the weakest word and syntactic awareness. The phonological awareness level of these three linguistic group, on the other hand, will be the same.

To test my hypothesis, I will use the commonly established experiments (concluded from the studies mentioned above) to test each kind of awareness (word, syntactic, and phonological). Before conducting those experiments, I will first conduct a vocabulary test to determine the language proficiency of each participants, and to make sure their language proficiency level in English is the same. Secondly, because the stage of development metalinguistic abilities is different in age, I will choose participants who are at the same age groups to ensure the accuracy of the results.

I predict that the results of each task will support my hypothesis. I expect all three linguistic groups will perform equally well on phonological tasks because children who have exposure to sign language does not give them an advantage to get exposure in a different sound system.

### **Experiments**

*Subjects:* There will be 90 children with 30 in each linguistic groups participating in these experiments. One group will consist of children who are fully proficient in both ASL and English, one will consist of children who are partially proficient in ASL while fully proficient in English, the other one will consist of children who are monolingual English speakers. The age range of all subjects will be 4-5 years old. And there will be an equal sex distribution of experiment participants.

All subjects will be children from middle class with the same family income range. Children who are fully proficient in both ASL and English will be hearing children, who come from families that have at least one deaf parent, and who receive education in normal school settings. Children who are partially proficient in ASL while fully proficient in English will be hearing children, who come from family that have at least one close deaf relative, and who have been exposed to be ASL for at least two to three years. Monolingual participants in this studies are English speaking children, who will come from a large monolingual area, and who have never been exposed to any languages other than English.

*Materials:* There will be four tasks conducted concerning different areas of children's metalinguistic awareness. The first experiment will be drawn from Dunn & Dunn (1981) -- Peabody Picture Vocabulary Test. The second experiment will be drawn from Ben-Zeev (1977)--Symbol Substitution Task. The third experiment will be drawn from Galambos and Goldin-Meadow (1990)—Ungrammatical Errors Identifying Task. The last experiment will be drawn from Campbell and Sais (1995) –the four phonological tasks including detecting a mismatch in initial sound of words, detect a mismatch in meaning, detect morphemes from words, and identifying letters.

*Procedures:* The first experiment will be used to determine the language proficiency of each participant, and to make sure that participants' English proficiency is at the same level. For this experiment, each participants will be presented with four pictures, only of the four pictures will illustrate the word spoken to them. Participants then will need to pick out the picture that

match the word. The test will start out with simple vocabularies and the difficulty of the vocabularies will slowly increase. Participants will continue the test until they made six mistakes.

After making sure that the participants are on the same verbal level, experimenters will then conduct the symbol substitution task concerning the word awareness of the participants. Participants will first be given a word substitute for a word, then they will be asked to use the word substitute in a given sentence. For example, participants will be asked to use the word “pasta” instead of “I”. And they will be asked to say the sentence “I am happy” using the word substitute. Participants of all three linguistic groups will be shown ten sets of word substitutes. The time they used to provide experimenters the correct answer will be recorded. Fully bilingual participants are expected to outperform the other two groups in this task, while partial bilingual participants are expected to outperform their monolingual peers.

The third experiment will focus on examining participants’ syntactic awareness. For this experiment, participants will be presented with 15 ungrammatical constructions, along with 15 grammatically correct “filters”. For example, an ungrammatical construction will be “the cat eat fish”, etc. For each construction, children will be asked to note errors, correct them, and explain why those errors were incorrect. The experimenters will record the time each participant uses to give an answer; and note whether the participants’ judgment on those sentence constructions is correct, and whether their reasoning is content-based or sentence structure-based. Fully bilingual participants are also expected to outperform the other two groups in this task, while partial bilingual participants are also expected to outperform their monolingual peers.

The fourth experiment will focus on analyzing children’s phonological awareness. There will be four tasks in this experiment: –detecting a mismatch in initial sound of words, detect a mismatch in meaning, detect morphemes from words, and identifying letters. The correctness of the participants’ responses along with the time they use to come with the answers will be recorded. For this experiment, I expect that all three linguistic groups will perform equally well for these four tasks.

## **Conclusion**

The aim of this study is to examine whether cognitive advantages exist in children who are bilingual in one speaking language and sign language, and whether the past research findings on the effect of bilingualism on children’s cognitive developments still apply to bilingual ASL-

English children. There are, however, some potential complications of this study. One complication could be the difficulty in finding children who are fully proficient in English while have some level of ASL exposures. The second challenge could be hearing children who have deaf parents tend to have fewer exposure to English comparing to other L2-English speaking children because the deaf community tend to be more conservative. It could be difficult to look for participants who process the same language level in English as their monolingual counterparts. The third challenge could be how to determine what degree of fluency is considered partially fluent in ASL.

Since metalinguistic awareness is seen as a crucial component of cognitive developments, studies in which metalinguistic abilities are measured will give us a better idea whether cognitive advantages also exists in bilingual ASL-English children. In other words, the findings of this study will help fill the research gaps on bilingualism studies examining hearing children with deaf parents. One of the differences between ASL-English and L2-English children is that ASL-English do not have exposure to the sound system of any languages other than English. It will be interesting to see whether ASL-English children still receive the phonological advantages that the other L2-English bilingual children process. The findings of this study will help study the reasons behind the impact of bilingualism on children's phonological advantages. In additions, the findings of this study will provide a deeper understanding of the impact of different degree of bilingualism on children's cognitive developments.



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