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Cultural Differences on the Recognition of
Social Word AAC Graphic Symbols
between Korean and American
Undergraduate Students

언어병리학과

강로원

2016

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이 논문을 석사학위 논문으로 제출함

2016 년 6 월

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Abstract

Individuals with impairments on speech-language ability can use Augmentative and Alternative Communication (AAC) to communicate with others and participate in social activities. One of the components of AAC, symbols, correspond with words or sentences of language. Therefore, AAC users and their communication partners should know the role of symbols in AAC for successful application and utilization of AAC.

On the recognition of graphic symbols of AAC, iconicity is an essential factor for symbol recognition. High iconicity of symbols makes individuals recognize the meaning of symbols easily, but iconicity is not the only factor of symbol recognition. Age, language knowledge, symbol experience, and cultural background are other factors for graphic symbol recognition. For the efficient and immediate communication between AAC users and their communication partners, considering various factors for the recognition of graphic symbol is important.

Providing appropriate vocabulary in AAC is also important. When selecting vocabulary for AAC devices, vocabulary type can vary in terms of communication situations, context, and partners. In the case of social words, however, they are not seriously influenced by communication situations, types, and partners. Moreover, social words are developed in early age and used as core vocabulary regardless of age, language, and disability. Considering concepts of social words and factors influencing symbol recognition, the purpose of this study is to examine the effects of iconicity and cultural background on the recognition of social word AAC graphic symbols between two cultural groups.

The participants of the study were 48 undergraduate students (24 Koreans, and 24 Americans), and 20 graphic symbols of 10 social words were selected for the stimuli from PCS™ (Mayer-Johnson, 2012) developed in the United States, and Ewha-AAC symbol (Park et al., 2014) developed in Korea. Each of 20 graphic symbols was assigned to a slide of PowerPoint Presentation, and presented to the participants. The transparency task asked the participants to guess and write down the meanings of the presented graphic symbols in 30 seconds for each slide. After the transparency task, the translucency task was conducted. The participants marked their degree of agreement with the meaning of the symbol on the 5-point rating scale, given 20 seconds for each slide. For the transparency task, 1 point was assigned to an answer of a participant corresponding with the original social word, and for the translucency task, rating scores of the 5-point scale were substituted for points of each item.

A 2×2 two-way mixed ANOVA was conducted to identify whether there were significant differences on the transparency task performance and the translucency task performance between the two groups according to graphic symbol types. The Spearman rank correlation coefficients were calculated to identify any associations of the transparency task performance between the two groups, and the translucency task performance between the two groups in the aspects of each social word AAC symbol. Additionally, the Spearman rank correlation coefficients were calculated to identify any relationships between the transparency task performance and the translucency task performance of each group and among the total participants in the aspects of each social word AAC symbol.

The results of the study were as follows. First, there were significant differences on the performance of transparency task between the two types of AAC symbol, and the two-way interaction between cultural groups and symbol types was statistically significant in the transparency task. The Korean students guessed the meanings of social word AAC symbols more correctly than the American students in Ewha-AAC symbol compared to PCS™. The correlation in the rank of social word AAC symbols from the transparency task performance between the two cultural groups was significant.

Second, there was statistically significant two-way interaction between cultural groups and symbol types on the translucency task. The Korean students gave higher scores on the rating scale to Ewha-AAC symbol, while the American students gave higher points to PCS™. The correlation in the rank of social word AAC symbols from the translucency task performance between the two cultural groups was significant.

Third, there were moderate and positive correlations in the rank of social word AAC symbols between the transparency task performance and the translucency task performance in each cultural group and among the total participants.

In conclusion, the results suggest that cultural background of words, symbols, and communication partners can be influencing factors for the recognition of graphic symbols.

In addition, the positive correlations between the performances of the two types of iconicity tasks suggest that transparency and translucency of graphic symbols may affect the symbol recognition. Moreover, the results suggest to consider the degree of transparency and translucency of graphic symbols when selecting symbols for AAC.

I . Introduction

A. Purpose of the Study

Successful participation in the social activities is one of the most important issues for individuals with special needs. As they want to participate in education, occupation, community, religion, leisure and so on, their social interaction with individuals without special needs increases. In this regard, successful communication plays a key role to participate in social activities, and individuals with special needs feel the necessity.

Although the majority of people communicate through verbal language, some people have limitations in verbal communication because of temporary or permanent impairments on speech-language ability. These people can use Augmentative and Alternative Communication (AAC) to communicate with others. AAC is using augment and alternative way to talk in order to give individuals with special needs of speech-language ability to participate in communication (ASHA, 2005). AAC consists of the following four components: symbols, aids, techniques, and strategies. Symbols of AAC correspond with words or sentences of language, therefore AAC users and their communication partners should know the role of symbols in AAC and implicit meanings of symbols for successful application and utilization of AAC.

Iconicity, cultural familiarity, learnability, and other various factors can affect the recognition of graphic symbols of AAC. Among these factors, symbol iconicity is an essential factor in learning symbols (Hetzroni et al., 2002; Huang & Chen, 2011; Kozleski, 1991; Schlosser & Sigafos, 2002), and

selecting graphic symbol sets for AAC users (Fuller & Lloyd, 1997). The iconicity including the terms transparency and translucency means the degree of resemblance between a symbol and a referent (Alant et al., 2013). Huang & Chen (2011) suggested that the iconicity of graphic symbol can affect the symbol learning in the early stage. However, they expressed some doubts about the necessity to consider the translucency as an influencing factor of the graphic symbols, since it was found that individuals with cerebral palsy and their peers can learn graphic symbols with low translucency after repeated exposures. This previous work has focused on the iconicity of symbol in learnability aspect for AAC users; however, communication is an instantaneous and mutual event. Therefore, for the immediate communication between AAC users and their communication partners, iconicity of graphic symbol is important because communication partners should understand the meaning of symbol at the first exposure to a graphic symbol.

Some arguments have been made that age, word knowledge, symbol experience, and cultural background are other factors for symbol recognition. In a study by Huer (2000), an experimental task required its participants from four different ethnic and cultural groups to assign the translucency ratings to three different symbol sets. Although the results indicated that there was lack of interaction between ethnicity and graphic symbol sets, in the discussion the researcher suggested that cultural background affects the translucency ratings. The lack of interaction between ethnicity and symbol sets can be speculated because three quarters of the participant groups were based on western culture and all symbol sets were also designed in western culture. Therefore, research with obvious differences between cultural groups

and graphic symbol sets may find other interesting results.

Carlson (1981) emphasized the importance of providing appropriate vocabulary in AAC for successful communication. AAC users are usually provided with both core vocabulary and fringe vocabulary. The core vocabulary is suitable for personal needs including various communication functions, and it also makes AAC users participate in balanced communication. When selecting vocabulary for AAC communication boards, categorizing communication situations and collecting vocabularies appropriate for each situation are the usual methods because vocabulary type can vary in terms of communication situations, context, and partners. In the case of social words, however, they are not seriously influenced by communication situations or types and ranges of communication partners. Moreover, social words are developed in early age and used as core vocabulary regardless of age, language, and disability. Social words require immediate expression in appropriate communication situations by users as well as immediate reception by communication partners for meaningful delivery of the intended message than other words. Considering concepts of social words and factors influencing symbol recognition, social word AAC symbols with high iconicity and cultural background may affect functional communication.

In this regard, the purpose of this study is to examine the effects of iconicity and cultural background on the recognition of social word AAC graphic symbols between two cultural groups. For this purpose, the transparency task and translucency task on social word AAC symbols from PCS™ developed in the United States, and Ewha-AAC symbol developed in Korea were conducted for the Korean and American undergraduate students.

B. Research Questions

The research questions are as follows

1. Are there significant differences on the performance of transparency task of social word AAC symbols between two cultural groups (Korean vs. American)?
 - 1-1. Are there significant differences on the performance of transparency task between two groups according to graphic symbol types (PCS™ vs. Ewha-AAC symbol)?
 - 1-2. Are there significant differences on the performance of transparency task between two groups according to each social word AAC symbol?

2. Are there significant differences on the performance of translucency task of social word AAC symbols between two cultural groups (Korean vs. American)?
 - 2-1. Are there significant differences on the performance of translucency task between two groups according to graphic symbol types (PCS™ vs. Ewha-AAC symbol)?
 - 2-2. Are there significant differences on the performance of translucency task between two groups according to each social word AAC symbol?

3. Are there significant correlations between the transparency task performance and the translucency task performance according to each social word AAC symbol?

C. Definition of Terms

1. Social Word AAC Symbols

The social word AAC symbols are presented as static graphic symbols denoting social words. Ten social words which were selected based on core vocabulary in Korean as well as in other language found in the prior studies were selected, and twenty graphic symbols were chosen from two different AAC symbol types.

2. Transparency

Transparency refers to the extent to which a symbol is guessable (Lloyd et al., 1997). When visual aspects of a symbol are greatly suggestive of its referent, the symbol is considered transparent. Consequently, without additional cues, the meaning of the symbol can be easily guessed by viewers, (Blischak et al., 1997).

3. Translucency

Translucency refers to the extent to which a symbol is recognizable (Lloyd et al., 1997). A symbol is considered translucent when the relationship between a symbol and its referent can be recognized by viewers once the referent is known although it is not immediately guessable. (Blischak et al., 1997).

4. AAC Symbol Type

Two kinds of AAC symbol set types were used in this study. The first is Picture Communication Symbols (PCS™) (Mayer-Johnson, 2012) which is developed in the United States and widely used in American culture, and the second is Ewha-AAC symbol (Park et al., 2014) which is developed appropriately for Korean culture.

II. Literature Review

A. Symbols of AAC

Augmentative and Alternative Communication (AAC) is using augment and alternative way to talk in order to give individuals with severe disabilities of speech-language ability to participate in communication and improve their communication ability (ASHA, 2005). In this part, severe disorders include temporary or permanent impairments. Therefore anybody who has limitations in activities or restrictions in participation because of difficulties in verbal communication can use AAC.

For successful provision of AAC service, four essential components, symbols, aids, techniques, and strategies, are necessary. Symbols correspond with words or sentences of language. Aids are physical tools for loading symbols. AAC users can choose techniques to select a message which users want to deliver, and establish strategies for an efficient way to deliver the message (Park & Kim, 2010).

When classifying AAC symbols, using additional aid determines unaided symbols and aided symbols (Beukelman & Mirenda, 2012). Gestures, vocalization, and manual sign systems are typical unaided symbols, because these symbols only use one's own body without any additional aid to deliver messages. Unaided symbols are convenient to use all the time, but they have limitations to interpret the meaning of messages to communicate with partners (Kim, 2014). Users of unaided symbols need specific physical ability to represent exact message. Furthermore, unlike gestures and vocalization,

people in different counties use different kinds of manual sign systems, so even manual sign system users have possibilities of restrictions in communication.

Tangible symbols, pictorial symbols, and orthographic symbols belong to aided symbols. Tangible symbols consist of actual objects, miniature objects, partial objects, and artificially associated and textured symbols. Photographs and line-drawing symbols are pictorial symbols, and orthographic symbols include braille, finger spelling, and orthography (Beukelman & Mirenda, 2012; Kim, 2014). Aided symbols require additional tools to deliver the message such as communication board, voice output communication aid, and various electronic equipment. Han (1998) suggested that aided symbols are based on visual representation, and such characteristic of aided symbols enables individuals with physical disability to indicate symbols with assistance of additional tools. Representational symbols including photograph, orthograph, and graphic symbols are widely used in AAC intervention because of permanent display and iconicity (Rhyner, 1988). In British and American culture, various kinds of graphic symbols have been developed. Picture Communication Symbols (PCS™) (Mayer-Johnson, 2012) is the most widely used graphic symbol for AAC around the world. Also, there are Widgit symbols from the United States and the United Kingdom, Pictograms from Canada, and Blissymbols developed in Canada (Beukelman & Mirenda, 2012; Kim, 2014). In Korea, Park et al. (2014) developed Ewha-AAC symbol which contains 5,000 graphic symbols appropriate for Korean culture and daily life. Ewha-AAC symbol is used in communication teaching-learning materials developed by Korea national institute of special education and My AAC

software developed by NCSOFT cultural foundation. KidsVoice (UBQ, 2004), Smart OK Toc Talk (Arisuedu, 2011), My first AAC (NCSOFT Cultural Foundation, 2014), and other AAC devices and softwares developed in Korea use their own independent graphic symbols.

As a variety of graphic symbols are used around the world, the individual needs for selecting appropriate and specialized graphic symbol sets are on the rise (Choi & Han, 2015). According to Light & Binger (1998) for detail word or sentence expression via graphic symbols, both factors of AAC users and communication partners have to be considered. Park et al. (2004) suggested to consider AAC users' age, personality, knowledge of language and communication partners' age, familiarity of AAC for graphic symbol selection.

B. Factors Influencing the Recognition of Symbols

The recognition of symbols, especially graphic symbols, is an important matter for AAC users and their communication partners. For recognizing graphic symbols of AAC, iconicity (Fuller & Lloyd, 1997; Hetzroni et al., 2002; Huang & Chen, 2011; Kozleski, 1991; Schlosser & Sigafoos, 2002), cultural familiarity with graphic symbols (Chompoobutr et al., 2013; DeKlerk et al., 2014; Huer, 2000; Nigam, 2003), and language knowledge (Harris & Reichle, 2004; Hartley & Allen, 2015; Kirkham et al., 2013; Light & Lindsay, 1991; Ronski & Sevcik, 1993, 1996, 2005) are suggested as influencing factors. Focusing on the characteristics of symbols which means close relationship between each symbol and referent, symbol effects, referent effects considered as familiarity with the referent, frequency effects of symbols like instructional effect, individual effects like age and knowledge of the communication of AAC users and communication partners, and contextual effects are included as influencing factors of symbol recognition (Alant et al., 2013; Dada, 2013).

Among various influencing factors of symbol recognition, iconicity is a significant factor in learning graphic symbols (Basson & Alant, 2005; Hetzroni et al., 2002; Huang & Chen, 2011; Kozleski, 1991; Schlosser & Sigafoos, 2002) and selecting graphic symbol sets for AAC users (Fuller & Lloyd, 1997). The iconicity which is including transparency and translucency, refers to the extent of similarity between a symbol and a referent (Alant et al., 2013). Based on the notion of iconicity, the iconicity hypothesis states that the similarity of graphic symbol with the referent may affect learning

the graphic symbol and memorizing the associations between graphic symbol and the referent (Fuller & Lloyd, 1997; Schlosser & Sigafos, 2002). Many studies supporting the iconicity hypothesis (Choi & Song, 2010; Fuller & Lloyd, 1991; Mizuko, 1987; Mizuko & Reichle, 1989; Schlosser & Sigafos, 2002; Wilkinson & Jagaroo, 2004) indicate that graphic symbols which have higher iconicity are recognized and learned more easily. High iconicity of symbols make individuals recognize and understand the referential meaning of symbols easily (Brown, 1979), but iconicity is not the only factor of symbol recognition. Other various influencing factors described above also have influences on the recognition of symbols (Bondy & Frost, 1994; Lloyd et al., 1997; Schlosser & Sigafos, 2002).

For the individual effects, age of AAC user (Emms & Gardner, 2010), language knowledge (Harris & Reichle, 2004; Hartley & Allen, 2015; Kirkham et al., 2013; Light & Lindsay, 1991; Ronski & Sevcik, 1993, 1996, 2005), symbol experience (Huang & Chen, 2011; Stephenson & Linfoot, 1996), and cultural background (Chompoobutr et al., 2013; DeKlerk et al., 2014; Huer, 2000; Nigam, 2003) are influencing factors. Emms & Gardner (2010) found that age is an essential factor on the recall of 72 graphic symbols rather than educational or language ability with fourteen children with physical disabilities and additional learning difficulties. Previous studies found that individuals with speech comprehension skills may understand the relationship between graphic symbols and their referents more easily (Ronski & Sevcik, 1993, 1996). Accordingly, in the study of Harris & Reichle (2004), three preschool children with moderate cognitive disabilities showed evidences of speech comprehension skills. Sevcik and Ronski (2005) indicated that

individuals with restrictive ability of language knowledge may have limitations in use of AAC. Huer (2000) suggested that cultural background which is including languages and life experiences affects the symbol recognition through the experimental task required the participants in four different ethnic groups, African-American, Chinese, European-American, and Mexican, to assign the translucency ratings to three different graphic symbol sets, DynaSyms, PCS™, and Blissymbols. In the study of Chompoobutr et al. (2013), sixty-five Thais who participated in the perception task of 64 graphic symbols indicated that the recognition of graphic symbols is influenced by a variety of factors in Thai culture. Moreover, in the study of DeKlerk et al. (2014), forty-four Afrikaans-speaking children and forty-six Sepedi-speaking children were asked to select graphic symbols which is representing four basic emotions after listening to the vignette indicating emotions, and the result showed that children differently perceived graphic symbols according to language types.

Yovetich & Young (1988) and Schlosser & Sigafos (2002) found that concreteness of a referent as the referent effects plays an important role as an influencing factor of symbol recognition. As mentioned earlier, highly iconic graphic symbols have high learnability than less iconic symbols, and such high iconicity can come from the degree of referents' concreteness.

Context is an additional factor (Dada et al., 2013; DeKlerk et al., 2014; Chae, 2014; Light, 1997; Visser et al., 2008). Previous studies found that the context in which graphic symbols are presented may affect the iconicity of those symbols. According to Visser et al. (2008) and Chae (2014), children could guess the meanings of symbols more correctly when they had

information of the context. In the study of Drager et al. (2006), two preschool children with autism showed achievements in their AAC symbol comprehension and expression when they learned target symbols in interactive play activities.

Furthermore, partner effect such as age and interaction skills of communication partner, and familiarity between AAC user and communication partner (Park et al., 2004) can be influencing factors for symbol recognition. Kent-Walsh & Mcnaughton (2005) suggested that education for communication partners enables better support the communication of AAC users.

C. Vocabulary Selection for AAC

In the past, individuals with physical disabilities were the major subjects of AAC. However, as the range of application becomes wider, experts should consider individuals with developmental disabilities and severe disabilities who require much effort for vocabulary acquisition (Park et al., 2004). For successful communication, providing appropriate vocabulary in AAC is important since scantily or inappropriately selected vocabulary can serve as an obstacle to communicate (Carlson, 1981; Fallon et al., 2001).

Traditional strategies for vocabulary selection of AAC is conducting ecological inventories to investigate AAC users' communication environments and situations, and using communication diaries to collect communication functions of AAC users, and comparing standard vocabulary list to the collected vocabulary list for the composition of individually appropriate vocabulary list (Morrow et al., 1993).

Although general knowledge of vocabulary development is a basic factor in selecting vocabulary for AAC (Park et al., 2004), each of AAC users has different degree of knowledge and necessity of vocabulary. Other factors should be considered as well. Lloyd et al. (1997) suggested that the assessment of AAC users' literacy skill which can affect vocabulary selection depends on the levels of the skill. The authors additionally proposed intellectual ability, age, interest as developmental factors for vocabulary selection. Furthermore, the involvement of multiple informants (Fallon et al., 2001) can be contained within influencing factors of vocabulary selection. Communication context and communication partner are additional factors

(Park et al., 2004). In the study of Bornman & Bryen (2013), the researchers checked the social validity of specific vocabularies which are related to disclosing one's experiences as victims of crime or abuse, and Bryen (2008) collected and checked the contextual vocabularies for the adult AAC users which are categorized as college life, transportation, health management, and so on.

Core vocabulary, vocabulary which is frequently and commonly used, is an important source of vocabulary selection for AAC (Beukelman et al., 1991; Fallon et al., 2001; Trembath et al., 2007). Core vocabulary, which is frequently occurred word or expression and usually used vocabulary by various individuals (Kim et al., 2003; Trembath et al., 2007; Vanderheiden & Kelso, 1987), enables individual who use AAC to communicate efficiently and effectively even with small numbers of it (Vanderheiden & Kelso, 1987). On the lists of core vocabulary, pronouns, prepositions, conjunctions, auxiliary verbs, adverbs, and determinants are commonly found (Trembath et al., 2007), and these words play the role of structure words in language (Banajee et al., 2003; Kim et al., 2003). Core vocabulary helps individuals to develop skills of reading and writing (Clendon & Erickson, 2008; Marvin et al., 1994). Moreover, core vocabulary enables AAC users participate in balanced communication (Park, 2014; Ronski & servick, 1988) by including diverse communication functions, requiring, expressing social friendliness and manners, and delivering information (Light, 1988).

Numerous studies about core vocabulary have stated social word as early developed vocabulary or frequently used vocabulary (e.g., Banajee et al., 2003; Boenisch & Soto, 2015; Lee et al., 2009; Lee et al., 2011). Lee et

al. (2009) found infants acquire social words (e.g., ‘No’ , ‘Hi’) which are used in parent-child interactions faster than other words. Lee et al. (2011) stated that frequently used nouns related to family, body parts, and daily necessities in daily activities and social words such as ‘Hi’ , ‘Bye’ are the basic learning vocabulary for children with developmental disabilities. These tendency for the core vocabulary has consistency in discordance of language (Boenisch & Soto, 2015; Robillard et al., 2014; Trembath et al., 2007), and age (Banajee et al., 2003; Kim et al., 2003). For balanced communication in AAC, teaching the use of social words such as emotional expressions and simple comments for something as well as other core vocabulary is important (Park, 2014). In the study of Choi & Han (2015), many children who start to learn the use of AAC device initially learn short phrases or sentences (e.g., ‘Hi’ , ‘Thank you’). This can help initial AAC users and partners communicate effectively and correctly in real communication situation (Choi & Han, 2015), and make AAC users have more opportunities to participate in social activities.

III. Methods

A. Participants

The participants for this study included undergraduate students who were studying communication disorders. A total of 48 female students (24 Koreans, 24 Americans) were selected from the universities in Seoul, Korea and Minnesota, the United States. All participants were in the age of 20s without intellectual, auditory, visual or speech-language disorders.

Students were divided into two groups (a Korean group and an American group). There were 24 students in each group. In the Korean group all participants' native language was Korean, and in the American group all participants' native language was English. <Table 1> summarizes the participants' information.

<Table 1> Information of the Participants

Group	N	Native Language	Female : Male	Age (years)	Educational Status
Korean	24	Korean	24 : 0	20-25	Undergraduate students
American	24	English	24 : 0	20-25	Undergraduate students

B. Experimental Materials

1. Target Social Words

Based on core vocabulary in Korean as well as in other languages found in the previous studies (e.g., Banajee et al., 2003; Boenisch & Soto, 2015; Kim et al., 2003; Lee et al., 2009; Lee et al., 2011; Robillard et al., 2014; Trembath et al., 2007), social words with high frequency of use were selected. Among these social words, 10 social words including ‘Hi (안녕)’ , ‘That’s good (그래)’ , ‘Yes (응)’ , ‘No (아니)’ , ‘Thank you (고마워)’ , ‘I’m sorry (미안해)’ , ‘I like it (좋아)’ , ‘I don’t like it (싫어)’ , ‘I’m fine (괜찮아)’ , ‘I don’t know (몰라)’ were selected as final stimuli.

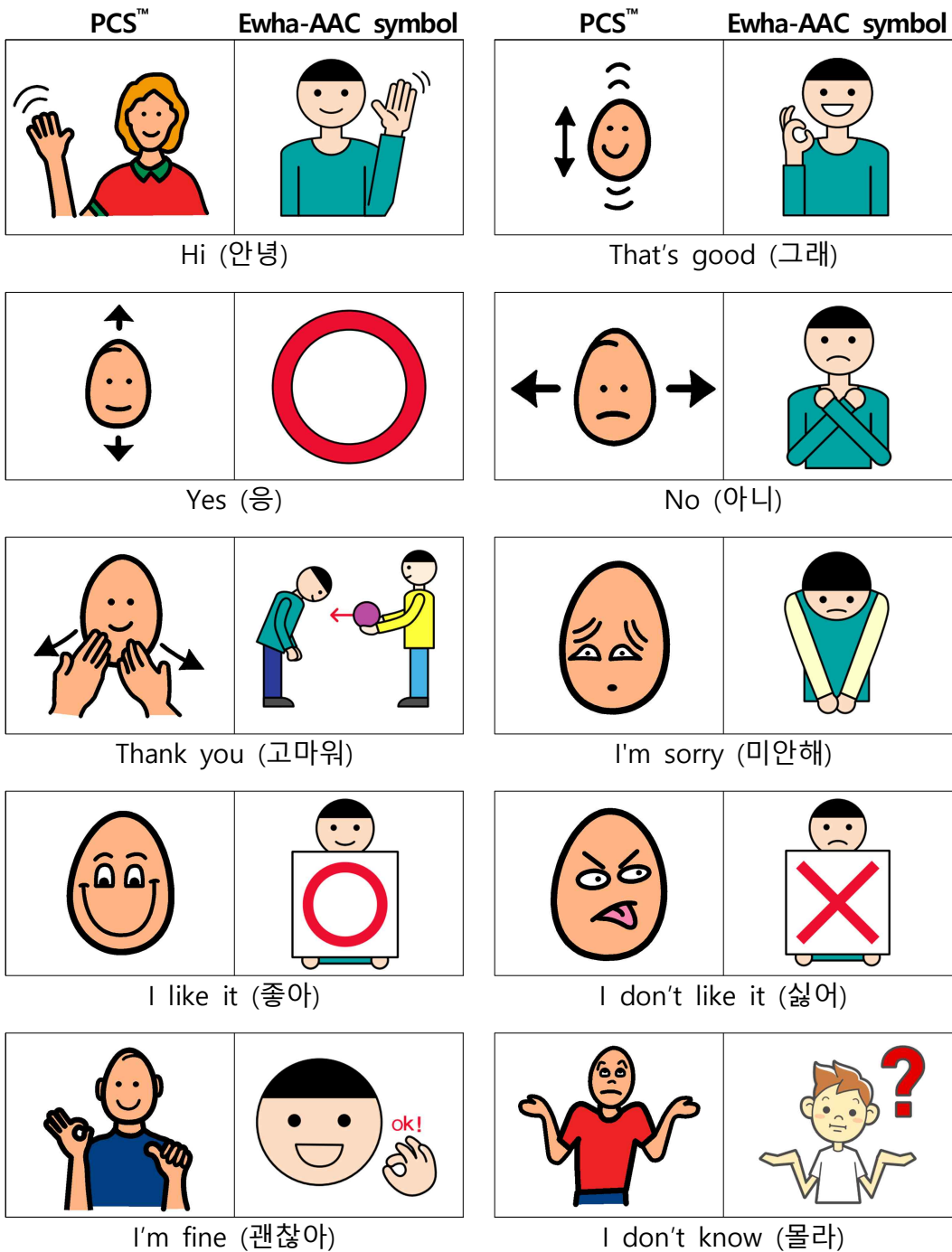
To demonstrate the validity of selected social words in Korea and the United States, 6 specialists in the department of communication disorders, 3 experts from Korea and 3 experts from the United States, conducted social word validity checklist with 5-point scale. The forms of Korean and English validity checklist are presented in <Appendix 1> and <Appendix 2>. The collected scores from validity checklist were averaged in <Table 2> and used to counterbalance the frequency of use.

<Table 2> Validity of Social Words

No.	Social Word	Mean (Min. — Max.)	
		Korean	American
1	Hi	5 (5-5)	5 (5-5)
2	That's good	4.3 (4-5)	3.6 (3-4)
3	Yes	4.6 (4-5)	5 (5-5)
4	No	4.6 (4-5)	5 (5-5)
5	Thank you	4.6 (4-5)	5 (5-5)
6	I'm sorry	4.6 (4-5)	5 (5-5)
7	I like it	4.6 (4-5)	5 (5-5)
8	I don't like it	4.6 (4-5)	5 (5-5)
9	I'm fine	4.6 (4-5)	5 (5-5)
10	I don't know	4 (3-5)	5 (5-5)

2. Display

Graphic symbols representing each of the 10 social words were selected from Picture Communication Symbols (PCS™) (Mayer-Johnson, 2012) which is widely used in American culture, and Ewha-AAC symbol (Park et al., 2014) which is developed appropriately for Korean culture. PCS™ consists of nearly 8,000 graphic symbols which are clear and simple line drawings. Moreover, it offers a broad range of topics such as emotions, food, clothes, daily living, medical procedures, and so on. In case of Ewha-AAC symbol, a school-aged boy is the basic character, and each of the nearly 10,000 graphic symbols is simply emphasizing the focus of its meaning (Yeon et al., in press). The symbols were retrieved by search for symbol labels that represented the 10 social words. Each of 20 graphic symbols, 10 graphic symbols selected from PCS™ and the other 10 graphic symbols selected from Ewha-AAC symbol, was assigned to a slide of PowerPoint Presentation, and presented on the screen via a projector. <Figure 1> shows the social word AAC symbols which were used in the study.



<Figure 1> Social Word AAC Symbols

C. Experimental Procedures

Two types of tasks were conducted in a classroom. 20 sheets of PowerPoint slides with 20 graphic symbols of 10 social words were presented for the participants in random order on the screen via the projector.

1. Transparency Task

Before one of the slides of 20 graphic symbols on a screen was shown to the participants, the researcher put a questionnaire for transparency task in front of the participants on the desk. After the researcher provided instructions for the transparency task (e.g., ‘Please write your own thoughts about pictures as follows.’), the participants were asked to guess and write down meanings of the presented graphic symbols in 30 seconds for each slide. The forms of the Korean and English questionnaires for the transparency task are presented in <Appendix 3>, <Appendix 4> as task 1.

2. Translucency Task

After the transparency task, the researcher gave instructions the translucency task (e.g., ‘The researcher will tell you the meaning of each picture. After you listen to it, please mark how you agree with the meaning of the picture on the rating scale.’). As participants watched the 20 sheets

of slides which were identically shown in the task 1, the researcher provided each social word of each symbol, and gave 20 seconds for each slide. In the previous pilot study, 30 seconds were given for each slide. However, 10 seconds were shortened because 30 seconds for each slide were superabundant for the translucency task. The participants who were presented with the social word and graphic symbol were asked to rate their match on a 5-point scale. The forms of the Korean and English questionnaires for the translucency task are presented in <Appendix 3>, <Appendix 4> as task 2.

D. Data Analysis

For the transparency task, 1 point was assigned to an answer of a participant corresponding with the original social word, and 0 point to each incorrect answer. Although the majority of the participants wrote plural responses, only the first response of each graphic symbol was the target answer to be scored. For each participants, the maximum score acquired from the transparency task was 10 for each symbol type. In case of each graphic symbol, the maximum score of the transparency task was 24.

On the other hand, the scores of the translucency task were differently counted. Rating scores of the 5-point scale were substituted for points of each item. For each participants, the maximum score of the translucency task was 50 for each symbol type. In case of each graphic symbol, the maximum score of the translucency task was 120.

E. Statistical Processing

The statistical analyses were conducted using SPSS 23.0 for Windows.

A 2×2 two-way mixed ANOVA, with groups (Korean, American) as between subject factor and with types of symbol (PCS™, Ewha-AAC symbol) as within subject factor was conducted. In order to identify whether there were differences on the transparency task performance and the translucency task performance between two groups according to graphic symbol types.

The Spearman rank correlation coefficients were calculated to identify any associations of the transparency task performance between two groups, and the translucency task performance between two groups in the aspects of each social word AAC symbol. Additionally, the Spearman rank correlation coefficients were calculated to identify any relationships between the transparency task performance and the translucency task performance of each group and among the total participants in the aspects of each social word AAC symbol.

F. Reliability

To demonstrate the reliability of scoring for the transparency task, the researcher and a graduate student in the Department of Communication Disorders participated in scoring and checked the reliability.

The total amount of the collected answers for the transparency task was scored and compared between two scorers. The formula used for calculating reliability is:

$$\text{Reliability (\%)} = \frac{\text{The accordant number for score}}{\text{Total score}} \times 100$$

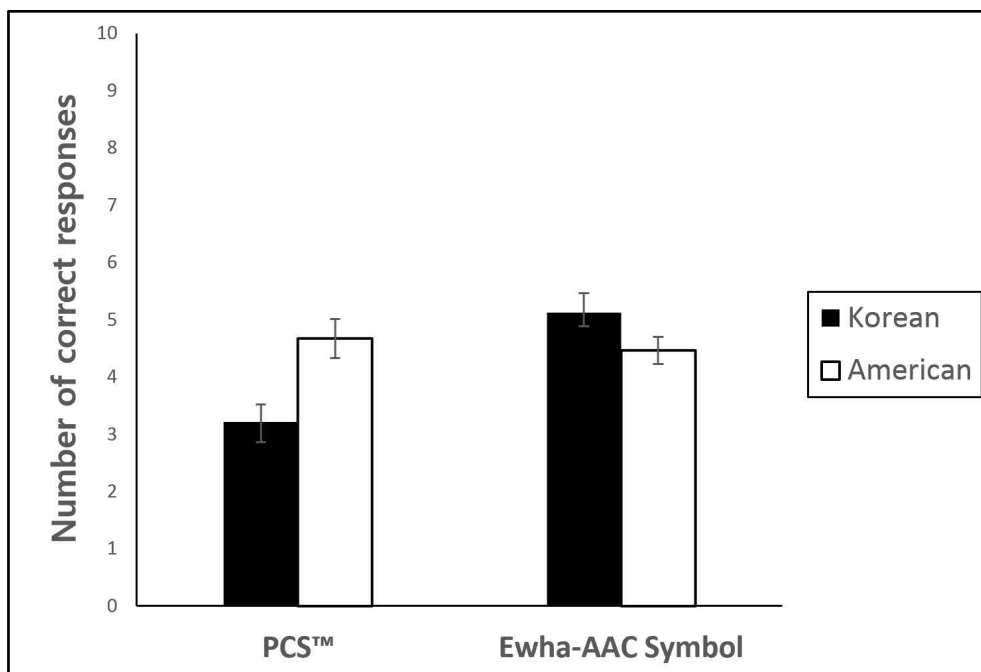
The reliability score between the two observers was 97.5% for the transparency task of the Korean group, and 93% for the transparency task of the American group.

IV. Results

A. Comparison of Transparency Task Performance

1. Comparison Transparency Task Performance of Two Groups According to Symbol Types

The study intended to establish statistically significant differences on the transparency task performance of the Korean group and the American group according to the two types of symbol sets. Descriptive statistics for the total number of correct responses for the transparency task in each symbol type between two groups is presented in <Table 3> and <Figure 2>.



<Figure 2> Transparency Task Performance of Two Groups According to Symbol Types

<Table 3> Descriptive Statistics of the Transparency Task Performance of Two Groups According to Symbol Types

Group	N	PCS™		Ewha-AAC symbol	
		Mean	SD	Mean	SD
Korean	24	3.208	1.503	5.125	1.676
American	24	4.666	1.685	4.458	1.178

<Table 3> and <Figure 2> show that in PCS™ the American students performed better than the Korean students, but in Ewha-AAC symbol the Korean students performed better than the American students. In order to identify whether these variations were significantly different or not, a 2×2 two-way mixed ANOVA was conducted and the results are given in <Table 4>.

<Table 4> The Results of the 2×2 Two-way Mixed ANOVA about the Transparency Task Performance of Two Groups According to Symbol Types

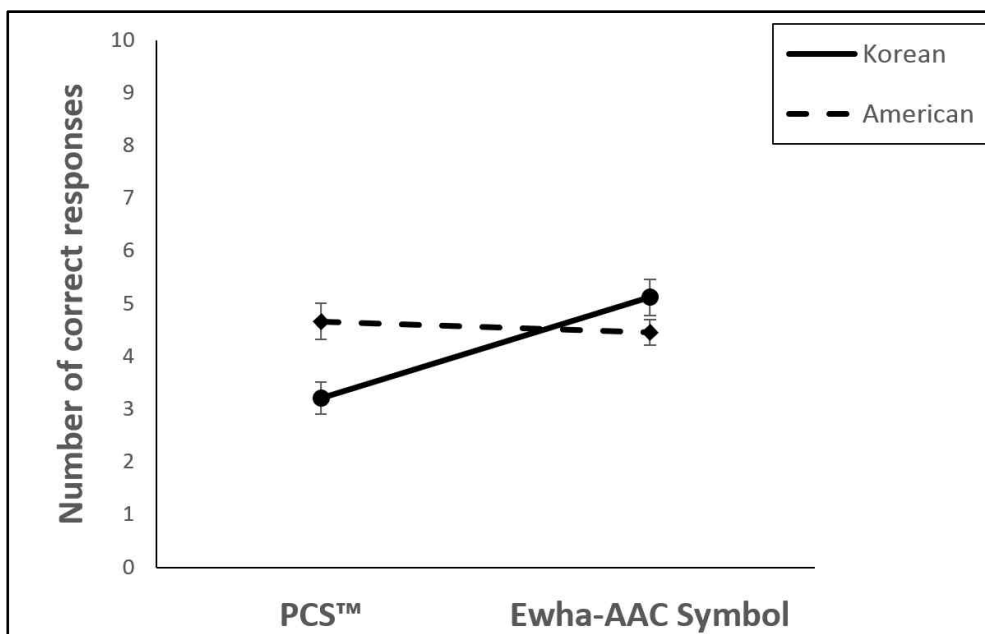
Source	Type III Sum of Squares	df	Mean Square	<i>F</i>	<i>p</i>
Between-Subjects					
Group	3.760	1	3.760	1.282	.263
Error	134.979	46	2.934		
Within-Subjects					
Symbol Type	17.510	1	17.510	10.209*	.003
Symbol Type × Group	27.094	1	27.094	15.797**	.000
Error (symbol type)	78.896	46	1.175		

* $p < .05$, ** $p < .0001$

The results from the 2×2 two-way mixed ANOVA show that a main effect for the groups was not statistically significant ($F(1, 46) = 1.282, p = .263$).

Meanwhile, a main effect for the symbol types was statistically significant ($F(1, 46) = 10.209, p < .005$). That is, the mean score of Ewha-AAC symbol (4.792) is significantly higher than the mean score of PCS™ (3.938).

Also, a two-way interaction between groups and symbol types was statistically significant ($F(1, 46) = 15.797, p < .0001$). The significant two-way interaction was caused by contradictory results of the task performance between the Korean group and the American group in each symbol type. The Korean group showed lower performance than the American group in PCS™, but in Ewha-AAC symbol they showed higher performance than the American group. <Figure 3> shows the two-way interaction between groups and symbol types.



<Figure 3> The Two-way Interaction between Groups and Symbol Types of the Transparency Task Performance

2. Comparison Transparency Task Performance of Two Groups According to Each Social Word AAC Symbol

The Spearman rank correlation coefficient was calculated in order to identify any association between the results of the transparency task performance between the Korean group and the American group according to each social word AAC symbol. The Spearman correlation coefficient in the rank of social word AAC symbols from the transparency task performance between the Korean group and the American group was 0.628 ($p < .005$) which implies they are moderately and positively correlated.

The symbol with the largest rank gap was ‘I’m sorry’ (Ewha-AAC symbol), and the symbol with the smallest rank gap was ‘Hi’ (Ewha-AAC symbol). In case of ‘I’m sorry’ (Ewha-AAC symbol), 15 Korean students gave the correct answers, but all of the American students gave incorrect answers. Meanwhile, ‘Hi’ (Ewha-AAC symbol) showed the smallest rank difference and the largest number of correct answers in both cultural groups. Additionally, ‘Hi’ (PCS™) and ‘I don’t know’ in both symbol types also showed small rank gap and large number of correct answers, too. However, ‘I’m sorry’ (PCS™) and ‘I like it’ (PCS™) with small rank difference showed the smallest number of correct answers in both cultural groups. On the contrary, large rank differences of ‘Yes’ (Ewha-AAC symbol) and ‘No’ (Ewha-AAC symbol) were caused by larger number of correct answers from the Korean students than the American students. Detailed information about the order of social word AAC symbols by score form the transparency performance between the Korean students and the American students is presented in <Table 5>.

<Table 5> Order of Social Word AAC Symbols by Score from the Transparency Task Performance of the Korean and American

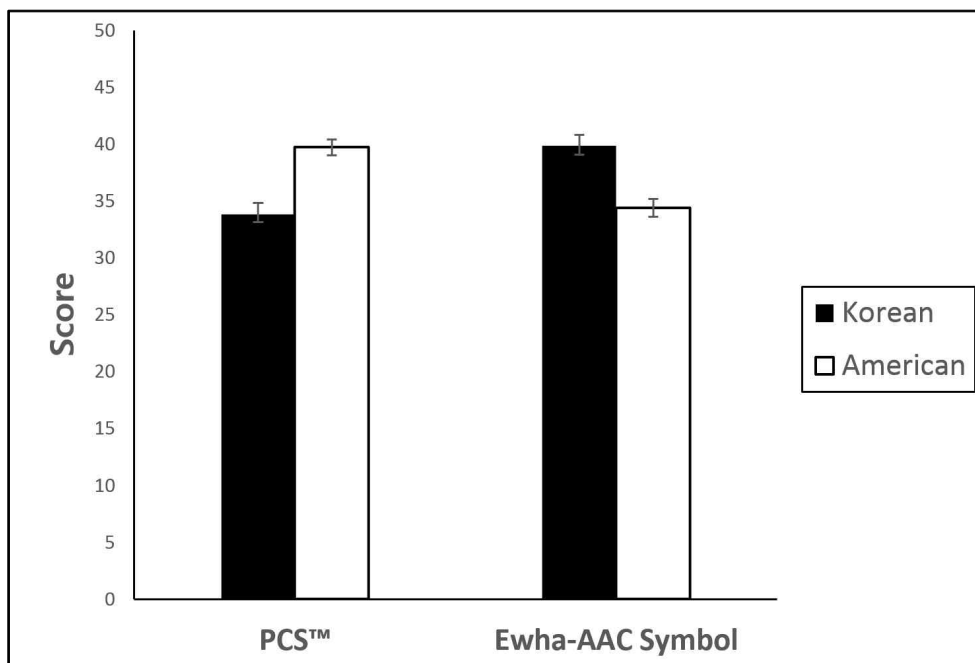
No.	Korean (n=24)		American (n=24)	
	Social Word (Symbol Type)	Score	Social Word (Symbol Type)	Score
1	Hi (Ewha-AAC symbol)	24	Hi (PCS™)	23
2	Hi (PCS™)	21	Hi (Ewha-AAC symbol)	23
3	I don't know (PCS™)	20	I'm fine (Ewha-AAC symbol)	23
4	I don't know (Ewha-AAC symbol)	18	That's good (Ewha-AAC symbol)	20
5	No (Ewha-AAC symbol)	15	I don't know (PCS™)	19
6	I'm sorry (Ewha-AAC symbol)	15	I don't know (Ewha-AAC symbol)	18
7	That's good (Ewha-AAC symbol)	14	Yes (PCS™)	17
8	I'm fine (Ewha-AAC symbol)	14	I'm fine (PCS™)	17
9	Yes (Ewha-AAC symbol)	12	That's good (PCS™)	16
10	I'm fine (PCS™)	9	I don't like it (Ewha-AAC symbol)	15
11	That's good (PCS™)	7	No (PCS™)	11
12	Yes (PCS™)	7	Thank you (PCS™)	8
13	No (PCS™)	7	No (Ewha-AAC symbol)	6
14	Thank you (Ewha-AAC symbol)	6	I like it (Ewha-AAC symbol)	2
15	I don't like it (PCS™)	3	I don't like it (PCS™)	1
16	I don't like it (Ewha-AAC symbol)	3	Yes (Ewha-AAC symbol)	0
17	I like it (Ewha-AAC symbol)	2	Thank you (Ewha-AAC symbol)	0
18	Thank you (PCS™)	1	I'm sorry (PCS™)	0
19	I'm sorry (PCS™)	1	I'm sorry (Ewha-AAC symbol)	0
20	I like it (PCS™)	1	I like it (PCS™)	0

*Score: The maximum score of each social word AAC symbol is 24.

B. Comparison of Translucency Task Performance

1. Comparison Translucency Task Performance of Two Groups According to Symbol Types

The study intended to establish statistically significant differences on the translucency task performance of the Korean group and the American group according to the two types of symbol sets. Descriptive statistics for sum of rating scale points acquired from the translucency task in each symbol type between two groups is presented in <Table 6> and <Figure 4>.



*Score: The maximum score of the translucency task for each symbol type is 50.

<Figure 4> Translucency Task Performance of Two Groups According to Symbol Types

<Table 6> Descriptive Statistics of the Translucency Task Performance of Two Groups According to Symbol Types

Group	N	PCS™		Ewha-AAC symbol	
		Mean	SD	Mean	SD
Korean	24	33.833	4.851	39.875	4.590
American	24	39.750	3.391	34.416	5.107

<Table 6> and <Figure 4> show that in PCS™ the American students rated higher scores than the Korean students, but in Ewha-AAC symbol the Korean students rated higher scores than the American students. In order to identify whether these variations were significantly different or not, a 2×2 two-way mixed ANOVA was conducted and the results are given in <Table 7>.

<Table 7> The Results of the 2×2 Two-way Mixed ANOVA about the Translucency Task Performance of Two Groups According to Symbol Types

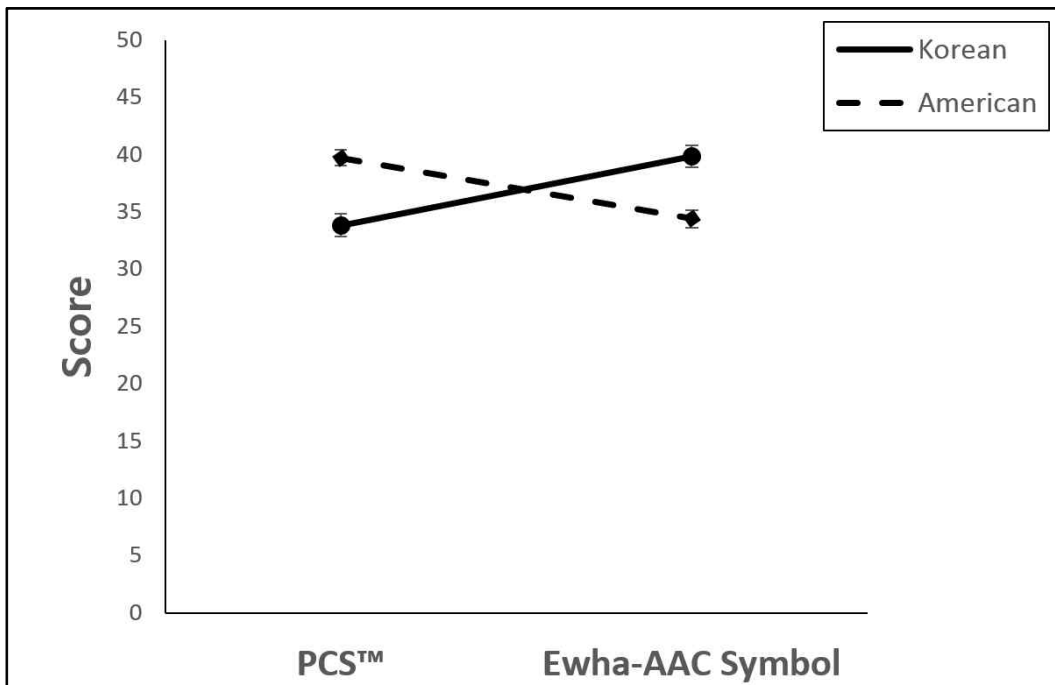
Source	Type III Sum of Squares	df	Mean Square	F	p
Between-Subjects					
Group	1.260	1	1.260	.05	.823
Error	1151.146	46	25.025		
Within-Subjects					
Symbol Type	3.010	1	3.010	.291	.592
Symbol Type × Group	776.344	1	776.344	75.160**	.000
Error (symbol type)	475.146	46	10.329		

* $p < .05$, ** $p < .0001$

The results from the 2×2 two-way mixed ANOVA show that a main effect for the groups was not statistically significant ($F(1, 46) = .05, p = .823$).

Also, a main effect for symbol types was not statistically significant ($F(1, 46) = .291, p = .592$).

Meanwhile, a two-way interaction between groups and symbol types was statistically significant ($F(1, 46) = 75.160, p < .0001$). The significant two-way interaction was caused by opposite task performance of the Korean and American in each symbol type. The Korean students gave lower points than the American students in PCS™, but in Ewha-AAC symbol they rated higher scores than the American students. <Figure 5> shows the two-way interaction between groups and symbol types.



*Score: The maximum score of the translucency task for each symbol type is 50.

<Figure 5> The Two-way Interaction between Groups and Symbol Types of the Translucency Task Performance

2. Comparison Translucency Task Performance of Two Groups According to Each Social Word AAC Symbol

In order to identify any association between the results of the translucency task performance of the Korean group and the American group according to each social word AAC symbol, the Spearman rank correlation coefficient was calculated. The Spearman correlation coefficient in the rank of social word AAC symbols from the translucency task performance between the Korean group and the American group was 0.596 ($p < .01$) which implies they are moderately and positively correlated.

The symbol with the largest rank gap was ‘Thank you’ (PCS™), and the symbol with the smallest rank gap was ‘Thank you’ (Ewha-AAC symbol). In case of ‘Thank you’ (PCS™), the American students gave 95 points, but the Korean students gave 43 points for it. Meanwhile, ‘Thank you’ (Ewha-AAC symbol) showed the smallest rank difference since the two cultural groups gave similar points to it, 56 from the Korean group and 54 from the American group. Additionally, ‘Hi’ and ‘I don’t know’ in both symbol types also showed small rank gap and high scores from each cultural group. However, ‘I’m sorry’ (PCS™) with small rank difference showed low scores in both cultural groups. On the contrary, large rank difference of ‘Yes’ (Ewha-AAC symbol) was caused by higher scores from the Korean students than the American students. Moreover, ‘I don’t like it’ in both symbol types showed large rank gap because of opposite scoring between the two groups. Detailed information about the order of social word AAC symbols by score form the translucency performance between the Korean students and the American students is presented in <Table 8>.

<Table 8> Order of Social Word AAC Symbols by Score from the Translucency Task Performance of the Korean and American

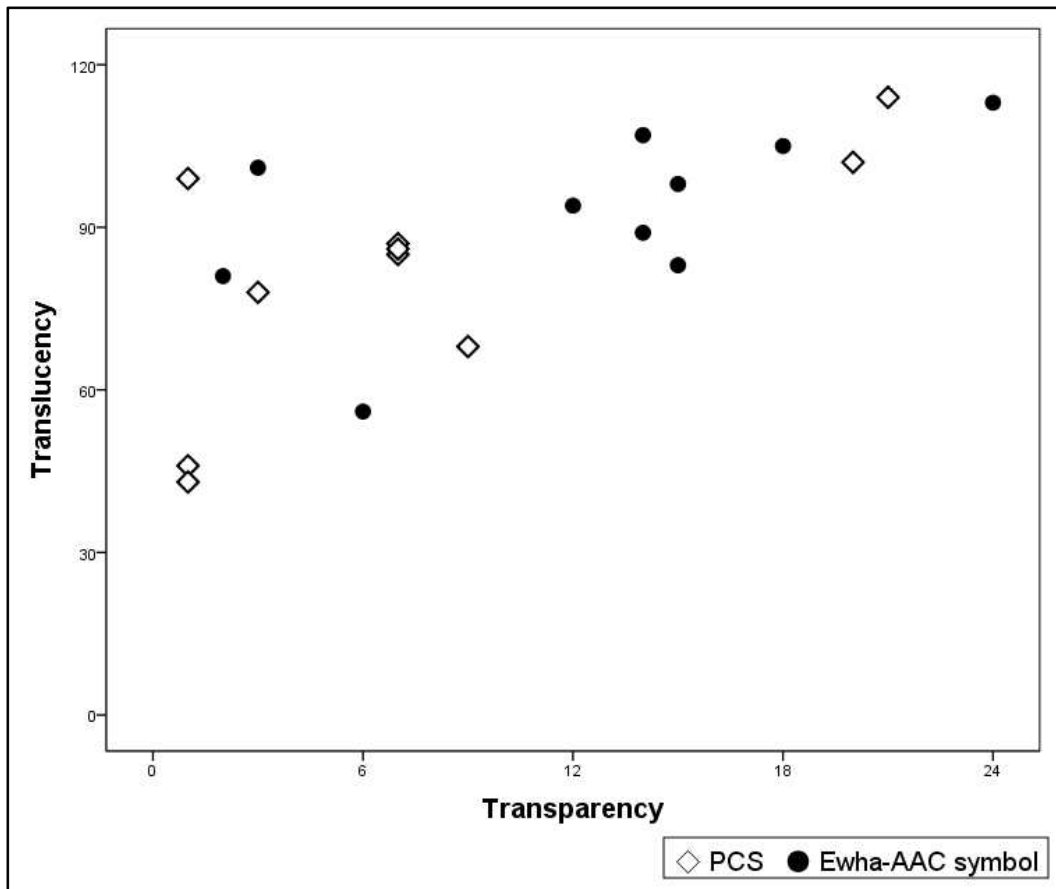
No.	Korean (n=24)		American (n=24)	
	Social Word (Symbol Type)	Score	Social Word (Symbol Type)	Score
1	Hi (PCS™)	114	Hi (Ewha-AAC symbol)	120
2	Hi (Ewha-AAC symbol)	113	I don't know (Ewha-AAC symbol)	119
3	That's good (Ewha-AAC symbol)	107	Hi (PCS™)	117
4	I don't know (Ewha-AAC symbol)	105	I don't know (PCS™)	114
5	I don't know (PCS™)	102	Yes (PCS™)	113
6	I don't like it (Ewha-AAC symbol)	101	That's good (Ewha-AAC symbol)	107
7	I like it (PCS™)	99	No (PCS™)	102
8	I'm sorry (Ewha-AAC symbol)	98	I don't like it (PCS™)	97
9	Yes (Ewha-AAC symbol)	94	Thank you (PCS™)	95
10	I'm fine (Ewha-AAC symbol)	89	I like it (PCS™)	90
11	Yes (PCS™)	87	That's good (PCS™)	89
12	No (PCS™)	86	I'm sorry (Ewha-AAC symbol)	88
13	That's good (PCS™)	85	I'm fine (Ewha-AAC symbol)	87
14	No (Ewha-AAC symbol)	83	I'm fine (PCS™)	83
15	I like it (Ewha-AAC symbol)	81	I don't like it (Ewha-AAC symbol)	82
16	I don't like it (PCS™)	78	No (Ewha-AAC symbol)	70
17	I'm fine (PCS™)	68	Thank you (Ewha-AAC symbol)	54
18	Thank you (Ewha-AAC symbol)	56	I'm sorry (PCS™)	54
19	I'm sorry (PCS™)	46	I like it (Ewha-AAC symbol)	50
20	Thank you (PCS™)	43	Yes (Ewha-AAC symbol)	49

*Score: The maximum score of each social word AAC symbol is 120.

C. Correlations between Performance of Transparency Task and Translucency Task

In order to identify any associations between the results of the transparency task and translucency task for 20 social word AAC symbols which were used in this study, the Spearman rank correlation coefficients were calculated.

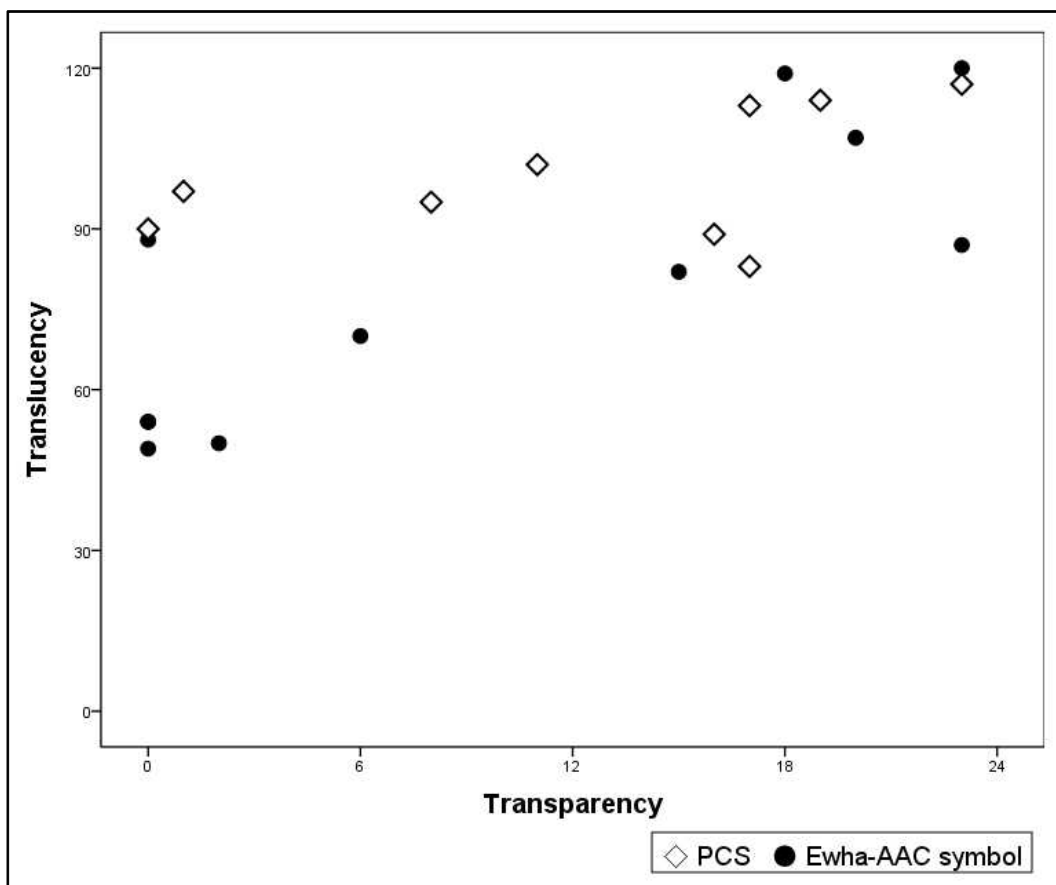
The Spearman correlation coefficient in the rank of social word AAC symbols between the transparency task performance and translucency task performance of the Korean group was 0.685 ($p < .001$) which implies they are moderately and positively correlated. <Figure 6> shows the Spearman rank correlation in the rank of 20 graphic symbols.



*Score: The maximum score of each social word AAC symbol is 24 for the transparency task and 120 for the translucency task.

<Figure 6> The Spearman Correlation in the Rank of Social Word AAC Symbols between the Transparency Task Performance and Translucency Task Performance of the Korean

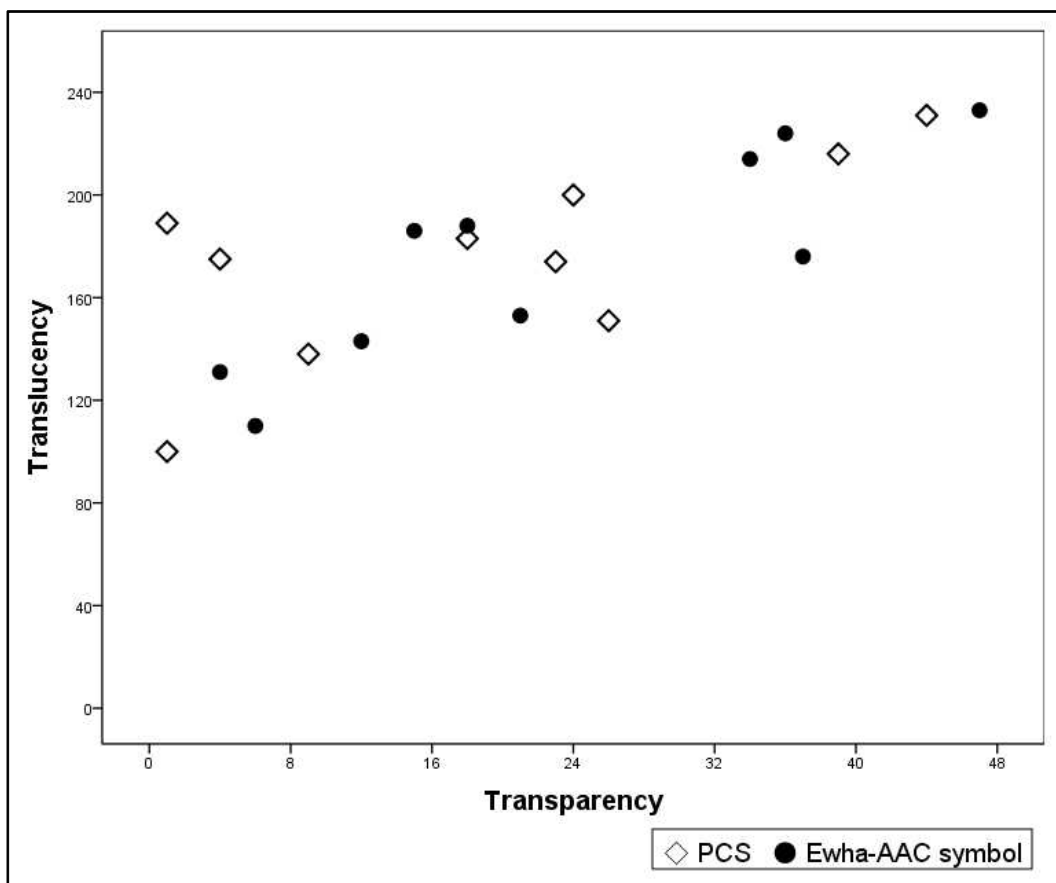
Additionally, the Spearman correlation coefficient in the rank of 20 social word AAC symbols between the transparency task performance and translucency task performance of the American group was 0.670 ($p < .001$) which implies they are moderately and positively correlated. <Figure 7> shows the Spearman rank correlation in the rank of 20 social words AAC symbols which were used in this study.



*Score: The maximum score of each social word AAC symbol is 24 for the transparency task and 120 for the translucency task.

<Figure 7> The Spearman Correlation in the Rank of Social Word AAC Symbols between the Transparency Task Performance and Translucency Task Performance of the American

Furthermore, the Spearman correlation coefficient in the rank of 20 social word AAC symbols between the transparency task performance and translucency task performance among the total participants was 0.707 ($p < .0001$) which implies they are moderately and positively correlated. <Figure 8> shows the Spearman correlation in the rank of 20 social words AAC symbols which were used in this study.



*Score: The maximum score of each social word AAC symbol is 48 for the transparency task and 240 for the translucency task.

<Figure 8> The Spearman Correlation in the Rank of Social Word AAC Symbols between the Transparency Task Performance and Translucency Task Performance of Total Participants

V. Discussion

In this study, social word symbols with two types of AAC symbol set were used in the symbol recognition as the transparency task and translucency task in order to find the differences in performance between the Korean and American undergraduate students.

The results showed that there were statistically significant differences on the total number of correct responses in the transparency task between two types of AAC symbol. Moreover, two-way interaction between cultural groups and symbol types was statistically significant, because the Korean students guessed the meanings of social word AAC symbols more correctly than the American students in Ewha-AAC symbol compared to PCS™. The correlation in the rank of social word AAC symbols from the transparency task performance between cultural groups was significant.

In the translucency task, the results indicated that there was statistically significant two-way interaction between cultural groups and symbol types. The Korean students gave higher scores on the rating scale to Ewha-AAC symbol, while the American students gave higher points to PCS™. The correlation in the rank of social word AAC symbols from the transparency task performance between cultural groups was significant.

According to the results from the Spearman correlation, there were moderate and positive correlations in the rank of social word AAC symbols between the transparency task performance and the translucency task performance in each cultural group and among the total participants.

A. Transparency Task Performance of Two Cultural Groups

This study showed that the two cultural groups, the Korean and American undergraduate students, guessed the meaning of social word AAC symbols differently according to symbol set types, PCS™ and Ewha-AAC symbol. There were no significant differences between the two groups on their performance of transparency task according to symbol types. However, there were significant differences between the two symbol set types. That is, social word AAC symbols in Ewha-AAC symbol were more guessable symbols than those in PCS™ for the participants of this study.

Additionally, there were significant differences on the total number of correct responses for the transparency task between the Korean and American students according to symbol types. In Ewha-AAC symbol, the Korean students showed larger number of correct responses than the American students, while the American students showed larger number of correct responses than the Korean students in PCS™.

In the aspects of each social word AAC symbol, there was moderate and positive correlation in the rank of social word AAC symbols from the transparency task performance between the Korean and American group. Top three ranked social word AAC symbols were similar for both groups: ‘Hi’ (Ewha-AAC symbol), ‘Hi’ (PCS™), and ‘I don’t know’ (PCS™) for the Korean students, and ‘I’m fine’ (Ewha-AAC symbol), ‘Hi’ (Ewha-AAC symbol), and ‘Hi’ (PCS™) for the American students. Meanwhile, bottom ranked social word AAC symbols were interestingly different between the two groups, for the Korean students ‘Thank you’, ‘I’m sorry’, and ‘I

like it' in PCS™ were bottom ranked symbols and all of them scored 1 point. In the case of the American students, however, 'Thank you', 'I'm sorry', and 'Yes' in Ewha-AAC symbol and 'I'm sorry' and 'I like it' in PCS™ were bottom ranked symbols since all of them scored 0 point. For the Korean students, PCS™ which were developed in American culture were difficult to guess, and for American students Ewha-AAC symbol which were developed in Korean culture were also hard to guess. This result was consistent with the previous findings that cultural background affects the symbol recognition (Chompoobutr et al., 2013; DeKlerk et al., 2014; Huer, 2000; Nigam, 2003).

In the aspects of social words as referents, 'Hi' and 'I don't know' in both symbol types showed high percentage of correct answers in both cultural groups, in case of 'Hi' in PCS™, the rank gap between the two groups was the smallest. Meanwhile, 'Thank you' and 'I'm sorry' were bottom ranked social words in the two groups. The rank gap of 'I'm sorry' in Ewha-AAC symbol and 'Thank you' in PCS™ between the two groups were large, but 'I'm sorry' in PCS™ showed small rank gap. Although social words have low concreteness as referents for AAC symbols, social word 'Hi' and 'I don't know' seemed to have higher concreteness regardless of cultural background. In this study, both cultural groups answered correctly for AAC symbol 'Hi' and 'I don't know' in different symbol types which described 'Hi' with a person waving hand and 'I don't know' with a person shrugging shoulders. On the contrary, the low percentage of correct answers and large rank gap of 'Thank you' in PCS™ may be caused by using American Sign Language for representing its

meaning which is not familiar with Korean. Additionally, 'I'm sorry' in Ewha-AAC symbol showed the largest rank gap between the two groups because more than half of the Korean students answered correctly, but all of the American students answered incorrectly. 'I'm sorry' in Ewha-AAC symbol described a down-headed boy with folded hands which is common action to express sorriness in Korean culture, but not common in American culture. This result can support the previous study that showed referent is an influencing factor for symbol recognition (Yovetich & Young, 1988; Schlosser & Sigafos, 2002), and imply that a symbol also contains referent's cultural characteristics if a referent itself has cultural backgrounds.

B. Translucency Task Performance of Two Cultural Groups

In this study, the two cultural groups, the Korean and American undergraduate students, differently scored the degree of translucency on social word AAC symbols according to symbol set types, PCS™ and Ewha-AAC symbol. There were no significant differences between the two groups on their performance of translucency task according to symbol types. Additionally, there were no significant differences between the two symbol set types in the translucency task. That is, social word AAC symbols in PCS™ and Ewha-AAC symbol got similar scores on the 5-point rating scales assessing degree of translucency on social word AAC symbols. from the participants of this study.

Additionally, there were significant differences in the total of rating scores from translucency task between the Korean and American students according to symbol types. In Ewha-AAC symbol, the Korean students gave higher points on rating scales than the American students. The American students, however, gave higher scores on rating scales than the Korean students in PCS™.

In the aspects of each social word AAC symbol, there was moderate and positive correlation in the rank of social word AAC symbols from the translucency task performance between the Korean and American group. Top three ranked social word AAC symbols were similar on both groups: ‘Hi’ (PCS™), ‘Hi’ (Ewha-AAC symbol), and ‘That’s good’ (Ewha-AAC symbol) for the Korean students, and ‘Hi’ (Ewha-AAC symbol), ‘I don’t know’ (Ewha-AAC symbol), and ‘Hi’ (PCS™) for the American students.

Meanwhile, bottom ranked social word AAC symbols were interestingly different between the two groups. For the Korean students ‘Thank you’ and ‘I’m sorry’ in PCS™ were bottom ranked symbols. For the American students, however, ‘Yes’ and ‘I like it’ in Ewha-AAC symbol were bottom ranked symbols. For the Korean students, it seemed difficult to agree with that PCS™ symbols perfectly expressed referents’ meanings, and the American students were could not easily agree with symbols from Ewha-AAC symbol set and their meanings as well.

In the aspects of relationship between social words and AAC symbols, ‘Hi’ in both symbol types were top scored social word in the two cultural groups, and in case of ‘Hi’ in Ewha-AAC symbol, the rank gap between the two groups was secondly small. This result implies that both cultural groups agree with social word ‘Hi’ and graphic symbol depicting a hand-waving person. Additionally, ‘I don’t know’ in both symbol types also showed small rank difference and high score. This result also implies that the participants of this study strongly agree with the graphic symbol with a shrugging person and social word ‘I don’t know’ . However, the rank gap of ‘Thank you’ in Ewha-AAC symbol was the smallest, but it gained low scores on the rating scale. This result implies that although rank gap of ‘Thank you’ in Ewha-AAC symbol between the two groups was the smallest, both groups disagreed with the description of social word ‘Thank you’ which described two persons: one was giving a ball and the other was bowing toward the giver. Meanwhile, ‘Thank you’ in PCS™ showed the largest rank gap between the two groups. The Korean students scored the lowest points on it, because the graphic symbol expressed ‘Thank you’ with

American Sign Language. Additionally, 'Yes' in Ewha-AAC symbol showed the secondly largest rank gap between the two groups, because the American students gave the lowest points to it. In case of social word 'Yes', PCS™ described a nodding-face, but Ewha-AAC symbol described a big red circle. For the American students, it seemed hard to agree with social word 'Yes' and a big red circle. 'I don't like it' in both symbol types showed big rank difference between the two groups. Although the social word was identical, the description of each graphic symbol in each symbol type was different. To represent 'I don't like it', a person holding a sign 'X' in Ewha-AAC symbol and an annoying face sticking out its tongue in PCS™. Interestingly, the Korean students scored high points on 'I don't like it' in Ewha-AAC symbol, the American students, however, scored high points on the symbol in PCS™. The results from this study imply that the similarities and differences in symbol description may affect the translucency of symbols.

C. Relationship between Performance of Transparency Task and Translucency Task

In this study, there were moderate and positive correlations in the rank of social word AAC symbols between transparency task performance and the translucency task performance in each cultural group and among the total participants.

Such correlations do not explain the causal relationship between transparency and translucency as influencing factors of symbol recognition. However, these results may support the study of Huang & Chen (2011) which found the positive association between transparency and translucency in graphic symbols and suggested that symbols with high transparency and translucency affect the initial symbol learning. In this regard, the positive correlations between the performances of the two types of iconicity tasks suggest that transparency and translucency of graphic symbols may affect the symbol recognition. Moreover, the results suggest to consider the degree of transparency and translucency of graphic symbols when selecting symbols for AAC.

D. Limitations

Limitations of this research are as follows.

First, diversity of participants was quite limited. This study involved twenty-four adults for each cultural group. All participants in both groups were female, in their early 20s, and undergraduate students. Follow-up study is required to secure sufficient diversity of participants for each group because it would be difficult to generalize the results of the current study with the limited characteristics of participants.

Second, target words of this study were limited into ten kinds of social words. Therefore, further study is needed with various kinds of vocabularies including nouns, verbs, adjectives and so on, for overall comparison between PCS™ and Ewha-AAC symbol.

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<Appendix 1> Social Word Validity Checklist (in Korean)

이름 _____

- 10가지 표현들이 아래에 제시되어 있습니다.
- 제시된 표현들이 한국에서 사회적인 표현으로 빈번하게 사용되는가에 대해 동의하는 정도를 아래의 5점 척도에 표시해(✓) 주세요.

	표현	전혀 동의하지 않음	동의하지 않음	보통	동의함	매우 동의함
1	안녕					
2	그래					
3	응					
4	아니					
5	고마워					
6	미안해					
7	좋아					
8	싫어					
9	괜찮아					
10	몰라					

<Appendix 2> Social Word Validity Checklist (in English)

Name _____

- 10 expressions are provided below.
- Please mark(✓) how you agree with the expressions that are frequently used as social expressions in the United States on the rating scale.

	Expression	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Hi					
2	That's good					
3	Yes					
4	No					
5	Thank you					
6	I'm sorry					
7	I like it					
8	I don't like it					
9	I'm fine					
10	I don't know					

<Appendix 3> Questionnaire (in Korean)

이름 _____

[과제 1]

성별 남자 여자

나이 20~24 25~29 30~34 35~39

※ 제시되는 그림을 보고, 그림이 의미하는 것을 생각나는 대로 쓰세요.

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

이름 _____

[과제 2]

성별 남자 여자

나이 20~24 25~29 30~34 35~39

1. 연구자가 1~20번까지 각 그림의 의미를 말해줄 것입니다.
2. 의미를 듣고, 제시된 그림과 의미가 일치하는 정도를 5점 척도에 표시해 주세요.

	전혀 일치하지 않음	일치하지 않음	보통	일치함	매우 일치함
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	1	2	3	4	5
7	1	2	3	4	5
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5
11	1	2	3	4	5
12	1	2	3	4	5
13	1	2	3	4	5
14	1	2	3	4	5
15	1	2	3	4	5
16	1	2	3	4	5
17	1	2	3	4	5
18	1	2	3	4	5
19	1	2	3	4	5
20	1	2	3	4	5

<Appendix 4> Questionnaire (in English)

Name _____

[Task 1]

Gender Male Female

Age 20~24 25~29 30~34 35~39

※ Please write your own thoughts about pictures as follows.

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Name _____

[Task 2]

Gender Male Female

Age 20~24 25~29 30~34 35~39

1. The researcher will tell you the meaning of each picture.
2. After you listen to it, please mark how you agree with the meaning of the picture on the rating scale.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	1	2	3	4	5
7	1	2	3	4	5
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5
11	1	2	3	4	5
12	1	2	3	4	5
13	1	2	3	4	5
14	1	2	3	4	5
15	1	2	3	4	5
16	1	2	3	4	5
17	1	2	3	4	5
18	1	2	3	4	5
19	1	2	3	4	5
20	1	2	3	4	5

국문초록

한국 대학생과 미국 대학생의 AAC 사회어 그림 상징 인식에 대한 문화적 차이

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말-언어 능력에 어려움이 있는 사람은 다른 사람들과 상호작용하고, 사회적 활동에 참여하기 위한 수단으로 보완·대체 의사소통(AAC)을 사용할 수 있다. 이 때, AAC의 구성요소 중 한 가지인 상징은 언어의 단어나 문장에 해당한다. 따라서 상징을 통해 효과적으로 메시지를 전달하기 위해서 AAC 사용자와 의사소통 상대자가 상징을 정확하게 인식하는 것은 중요하다.

AAC 상징 인식에 있어서 도상성(iconicity)은 필수적인 요인이다. 높은 도상성을 가진 상징은 한 개인이 상징을 보다 쉽게 이해하는 데 도움이 된다. 그러나 도상성 외에도 나이, 언어 지식, 상징에 대한 경험, 문화적 배경 등 다양한 요인들이 상징 인식에 영향을 미친다. 그러므로 AAC 사용자와 의사소통 상대자의 효율적이고 즉각적인 상호작용을 위해서 상징 인식에 영향을 미치는 다양한 요인들의 폭넓은 고려가 요구된다.

AAC를 통한 성공적인 의사소통을 위하여 적절한 어휘를 제공하는 것도 또한 중요하다. AAC 도구를 위한 어휘를 선정할 때, 어휘의 종류는 의사소통 상황, 맥락, 상대자에 따라 달라질 수 있다. 반면 사회어의 경우 이러한 요인들의 영향을 상대적으로 적게 받으며, 이른 나이에 발달하여 연령, 언어, 장애 유무에 관계없이 다수의 사람들이 핵심 단어로 사용하고 있다. 이와 같은 사

회어의 성격과 AAC 상징의 특성을 고려하여, 본 연구에서는 한국인과 미국인 대학생을 대상으로 AAC 사회어 그림 상징 인식에 도상성과 문화적 배경이 미치는 영향을 살펴보고자 하였다.

본 연구에는 총 48명의 대학생 (한국인 24명, 미국인 24명)이 참여하였다. 10개의 사회어를 나타내는 20개의 그림 상징들은 Picture Communication Symbols (PCS™) (Mayer-Johnson, 2012)와 지식경제부 지원의 국민편익증진 기술개발사업 (Quality of Life Technology: QoLT) 프로젝트를 통해 개발된 이화-AAC 상징에서 각각 10개씩 선정하였다. 선정된 그림 상징들은 PowerPoint 화면을 통해 참가자들에게 제시되었다. 투명성 과제 (transparency task)에서는 한 상징 당 30초의 시간을 제공하였으며, 참가자들에게 각 상징의 의미를 적도록 하였다. 투명성 과제 후에 실시하게 되는 반투명성 과제 (translucency task)에서는 한 상징 당 20초의 시간을 제공하였으며, 참가자들에게 각 상징과 그에 해당하는 의미가 적절한지에 대해 동의하는 정도를 5점 척도에 평정하도록 하였다.

연구 결과는 다음과 같다. 첫째, 투명성 과제에 대한 참가자들의 총 정반응 수에서 상징 유형 간 차이는 유의하게 나타났지만, 집단 간 차이는 유의하지 않았다. 그러나 집단과 상징 유형에 대한 이원상호작용이 통계적으로 유의하였다. 한국 대학생들은 이화-AAC 상징에서 더 많은 정반응을 보인 반면, 미국 대학생들은 PCS™ 상징에서 한국 대학생들보다 더 많은 정반응을 보였다. 또한 집단 간 정반응 수의 합에 따른 개별 상징 서열에 대한 상관관계가 통계적으로 유의하였다.

둘째, 반투명성 과제에 대한 참가자들의 평정 점수 합에서 상징 유형 간, 집단 간 차이가 나타나지 않았다. 하지만 집단과 상징 유형에 대한 이원상

호작용이 통계적으로 유의하였다. 한국 대학생들은 이화-AAC 상징에 더 높은 평정 점수를 부여한 반면, 미국 대학생들은 PCS™ 상징에 한국 대학생들보다 더 높은 평정 점수를 부여하였다. 또한 집단 간 평정 점수의 합에 따른 개별 상징 서열에 대한 상관관계가 통계적으로 유의하였다.

셋째, 투명성 과제에서 정반응 수의 합과 반투명성 과제에서 평정 점수의 합에 따른 개별 상징의 서열에 대한 상관관계는 한국인 집단, 미국인 집단, 그리고 전체 참가자 모두에서 통계적으로 유의한 정적 상관을 보였다.

이러한 연구 결과를 통해 본 연구는 동일한 단어를 표현하는 AAC 상징이라 하더라도, 단어, 상징, 의사소통 상대자의 문화적 특성이 AAC 사회어 그림 상징 인식에 영향을 미칠 수 있음을 확인한 것에 의의가 있다.

또한, 두 종류의 도상성 과제 간 수행 결과에 따른 개별 상징 서열에 대한 정적 상관관계는 그림 상징의 투명성과 반투명성이 AAC 상징 인식에 영향을 미칠 수 있음을 시사한다. 따라서 AAC 상징 선정 시 그림 상징의 투명성과 반투명성 정도에 대한 고려의 필요성을 시사한다.