



## Research Article

© 2023 Jamal Ahmad and Eman Al-Zboon.  
This is an open access article licensed under the Creative Commons  
Attribution-NonCommercial 4.0 International License  
(<https://creativecommons.org/licenses/by-nc/4.0/>)

Received: 15 November 2022 / Accepted: 16 February 2023 / Published: 5 March 2023

# The Knowledge Hearing Impairment Children Have About Common Public Signs

Jamal Ahmad<sup>1</sup>

Eman Al-Zboon<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Education, University of Sharjah,  
P. O.Box 27272 Sharjah, United Arab Emirates;  
Associate Professor, Department of Child Education,  
Queen Rania Faculty for Childhood, The Hashemite University,  
P.O Box 330127, Zarqa 13133, Jordan

<sup>2</sup>Associate Professor, Department of Special Education,  
Queen Rania Faculty for Childhood, The Hashemite University,  
P.O Box 330127, Zarqa 13133, Jordan

DOI: <https://doi.org/10.36941/jesr-2023-0042>

## Abstract

*This study aimed to examine sign recognition in children with hearing impairment ages 6 - 9 years old from Al-Zarqa city in Jordan. Public signs were shown to the children and they were asked to say what the sign represented. Results were that children have difficulty recognizing a sign's meaning, as reflected in their answers. Results also showed that children can identify iconic signs like a mosque the most, and the index of a skull for danger or symbol such as the letter H to indicate a hospital the least. For signs they did not correctly identify, they viewed the sign as a picture, not a sign that has meaning. The study shows hearing impaired children's familiarity with signs in public spaces.*

**Keywords:** Hearing impairment children; environmental print; signs & symbols

## 1. Introduction

Hearing impairment is defined as being partially or completely deaf in one or both ears (Hardman, Drew, & Egan, 2005). The earlier in life this occurs, the more difficulty a person has in acquiring spoken language (Chimedza & Peters, 2001). Language acquisition has critical implications to childhood development. It can limit a child's ability to have interactions (Moore, 1996). Teachers must use print, pictures, gestures, and movements to convey meaning to hearing impaired children (Al-Zboon, 2016, 2017; Moss, 1995).

Previous research has shown that using pictures is a beneficial strategy in teaching children (Hsiao & Shih, 2015; Pettersson, 1983). This is because children can understand the meaning of pictures before they can understand the meaning of written words (Bialystok, 2000; Hsiao & Chang, 2016). A study of three and four year old non-readers found that children could identify a symbol paired with an object easier than the written word paired with the same object (Apperly, Williams, &

Williams, 2004). It has also been found that children understand a narrative structure through picture books (Tulk, 2005). Picture books have been used in teaching (Hsiao & Chang, 2016). Studies have found that using picture books enhances children's creativity because it encourages imagination (Kasmaienezhadfar, Pourrajab, & Rabbani, 2015). Not only do picture books enhance learning and creativity, it has also been shown that children exhibit more kindness behavior after viewing picture books that depict acts of kindness (Retnowati, Salim, & Saleh, 2018).

Previous research has found that hearing impaired children learn language easier when teachers use pictures as part of literacy learning (Al-Zboon, 2016, 2017; Moss, 1995; Thompson, 2017). Signs can look like pictures and have the same function of conveying a meaning, so when children learn to read signs they are taking a step toward literacy.

Hearing impaired children must be allowed to explore environmental print, such as signs and logos (Briggle, 2005). Children encounter environmental print on a daily basis within the home and out in the community (Fingon, 2005; Miller, 1995; Neumann, 2018). These signs can be an icon, an index, or a symbol. An icon looks like the thing it represents, such as a photograph. An index gives evidence of the object, such as smoke to indicate fire. A symbol requires cultural learning to draw the meaning of the image to the object it is meant to represent. Numbers and Alphabets are examples of symbols (Peirce, 1883).

A children's textbook from 1928 taught children about signs such as No Parking, Slow, Danger Ahead, Hospital Zone, Speed Limit, Exit, and Entrance (Dearborn, 1928). These were signs commonly found in the children's environment. A study of 5-year-olds found that they could successfully match iconic signs with the object they meant to represent, which showed that learning representations is easy (Tolar, Lederberg, Gokhale, & Tomasello, 2008).

Learning signs and learning oral language have some similar features (Tolar, et al., 2008). Sign language uses icons, which suggests it is easier to learn (Schick, 2006; Wilcox, 2004). Researchers have identified use of icons as an important part of literacy (Pietrandrea, 2002; Taub, 2001). Recognizing signs start around age 2.5, but is refined by age 5, when children can most accurately guess the meaning of many signs. Signs represent an object by way of social agreement that is what the sign means, and signs ask for action (Dewey, 1938/2008; Langer, 2009). A study found that signs representing an action were easier for children to identify than signs representing an object (Tolar, et al., 2008). For children to integrate into their environment, they must learn to interpret signs such as exits signs, weather symbols, road signs, logos, and numbers (Ahmad, et al., 2018; Nelson, 2009; Teubal, Dockrell, & Tolchinsky, 2007).

Teaching hearing impaired children how to read has many challenges. Some of these challenges are the same as with hearing children, but some are unique to hearing impaired children (Rottenberg, 2001; Rottenberg & Searfoss, 1992, 1993). Children's ability to process language is affected by hearing impairment, which in turn can affect their performance in school, even when their intellectual abilities are similar to children who can hear (Williams & Finnegan, 2003). Hearing impaired children may have lower reading skills (El-Zraigat, 2011). In learning to read Arabic, it is challenging because the letter shapes look the same and the way Arabic is spoken differs from the way it is written. The shapes of the letters are visually similar, and spoken Arabic is different from written Arabic (Ferguson, 1959; Saiegh-Haddad, 2003; Aram, et al. 2013). Previous studies have shown that sign recognition can help in literacy development (Giles & Tunks, 2010; Goodman & Altwerger, 1981; Neumann, Hood, & Ford, 2013). Children see the word alongside a picture of what the word describes and through "visual learning" can understand the word's meaning (Daniels, 2001). A study of hearing children and their ability to recognize public signs found that many children did not know the meaning of common signs in their environment (Ahmad, et al., 2018). There is no study of hearing impaired children's ability to recognize public signs.

The study categorized signs as icons (e.g. picture of man or woman for the restroom), index (image of skull to represent danger) and symbols (the letter "H" to indicate a hospital). Signs chosen were those commonly found within the child's environment. The research questions were

1. Do children with hearing impairments possess public sign recognition and if so, which signs

- are most easily recognized?
2. Do children in general possess public sign recognition, and if so, where do they see these signs?
  3. What meaning do children give to signs they incorrectly identify?

## 2. Method

To answer the research questions, the study employed a qualitative methodology to determine how children interpret public signs commonly available around them in their environment.

### 2.1 Participants

Participants in this study were 44 children aged 6-9 years old (28 boys 63.64 % and 16 girls 36.36 %). They were recruited from Al-Zarqa city center for Deaf/Hearing impaired children. This is the only center for hearing impaired children in Al-Zarqa city.

### 2.2 Ethical considerations

Before the study began, the principal of the deaf center in Al-Zarqa city and the parents granted permission. Only children with permission from both the principal and the parents were permitted to participate in the study. The principal and parents were told the study's purpose and the measures taken to ensure confidentiality. No identifying information was needed from participants and they were told they have the right to withdraw from the study at any time.

### 2.3 Research Instrument

To assess children's recognition of signs, a survey instrument developed by Ahmad, Al-Zboon, and Dababneh, 2018 was used. This survey has been validated and used with hearing children before. The instrument consists of a list of 43 colored public signs that are the most common public signs found in children's environment, consisting of 15 warning signs, 17 guided signs and 11 public services signs. For this study, children were asked by the sign translator if they recognized the sign and, if yes, to identify the meaning of the sign and where they had seen this sign before. Then the translator would record the child's answers.

### 2.4 Data collection

The interview method was used to collect data from hearing impaired children by asking them about the common signs around them in their environment. The interview method has been found as useful for understanding information from the person's point of view (Merriam & Tisdell, 2015). The researcher is the instrument through which data collection occurs (Paisley & Reeves, 2001).

The sign language translator (SLT) in the deaf center conducted the interviews with the children. The sign language interpreter has over 20 years of experience working with deaf children and is an expert in his field.

Each child was interviewed separately in a secluded space in the deaf center and the interviews lasted 30 - 45 minutes. Instructions to the sign language translator (SLT) on how to manage the interviews with children was given, as well as where to write answers on the instrument.

The sign was accompanied by a question. The child responded yes or no as to whether they recognized the sign, and the SLT marked the box accordingly. If the child recognized the sign, the translator then asked the child where he/she sees the sign. If the child did not recognize the exact meaning of the sign, the translator would write the answer the child provided. Moreover, information about the child such as sex and age were also recorded by the SLT.

2.5 Data analysis

To facilitate the data analysis process, each sign was analyzed separately in terms of how many children recognized/did not recognize the sign's meaning, what meaning the child gave to signs they did not recognize, and where they had seen the sign before. Moreover, frequencies and percentages for each sign were calculated using Statistical Package for Social Sciences (SPSS-version 22).

3. Results

3.1 Findings of question 1

The aim of question one was to examine if children who have hearing impairments recognize the meaning of common signs found in their environment and if so what the most recognized signs and the least recognized signs are. Overall, results from this study showed that children have difficulty recognizing most of the signs around them in their environment. Children recognize iconic signs the most and index and symbol signs the least. The frequencies and percentages for the most recognized signs are presented in Table 1. The least recognized signs are in Table 2.

Table 1. Frequencies and percentages for the ten most recognized signs.

The sign	Frequencies	Percent %
Mosque	30	68.18
Drinking Fountain	28	63.64
Place waste in basket	27	61.36
Handwashing station	26	59.09
Traffic light	25	56.82
Stairs	24	54.54
Stop sign	22	50
Bathroom for men and women	20	45.45
Gas station	9	20.45
Wear Seatbelt	8	18.18

Table 2. Frequencies and percentages for the ten least recognized signs.

The sign	Frequencies	Percent %
Exit	1	2.27
Danger- electricity	1	2.27
Private bathroom for the disabled	1	2.27
Pharmacy	1	2.27
No smoking	2	4.54
Hospital	2	4.54
A path for people with special needs	3	6.81
Danger do not approach	4	9.09
Elevator	4	9.09
Airport	4	9.09

3.2 Results of question 2

For question 2, children who recognized the meaning of signs were asked where they see the signs. Children reported that they see these signs in places such as hospital/emergency room, street, school/center, park, home, pharmacy, car, wood pillar and in the mall.

### 3.3 Results of question 3

For question 3, children who did not recognize the sign were asked what they thought the sign meant. Results showed that children said different meanings for each sign. Mostly, the children interpreted the sign based on a literal meaning of the picture. The picture for the men's or women's bathroom was interpreted as simply boy and girl. Non-drinking water was interpreted as cup and water. The sign for library was seen as book or boy reading. Children gave the answer of camera when seeing a no photography allowed sign. The sign for restaurant was seen as knife and fork. The sign for barber was interpreted as comb. The sign for mosque was viewed as a house. The sign for danger – electricity was interpreted as light.

## 4. Discussion

The study looked at hearing impaired children's perceptions of the meaning of common signs. Results revealed that hearing impaired children recognize iconic signs (e.g. mosque/ bathroom for men and women) the most and index (e.g. image of skull to indicate danger) and symbol (e.g. Letter H for hospital) signs the least. The result is not surprising because signs like mosque and bathroom are more common in children's environment, and therefore the children have had more exposure to it. The results are similar to what other researchers have found, which is that the more a child is exposed to a sign, the more likely they will learn the sign's meaning (Ahmad, Al-Zboon, & Dababneh, 2018; Brereton, 2010; Cooper, 2002; Stephen & Mathur, 2012; Tolar, Lederberg, Gokhale, & Tomasello, 2008). This is in contrast to warning signs such as no swimming, no smoking, stop, and danger, which children recognized the least. This may be because children are rarely around these signs. It may also be that sign recognition is difficult for those with hearing impairments. Another reason may be that teachers who work with hearing impaired children may not call attention to the signs. Other studies have shown that children will not learn the meaning of a sign on their own. They rely on teachers and parents to identify signs and explain their meaning (Daniels, 2001; Brereton, 2010). A child's inability to recognize a sign may mean that the child needs more help identifying environmental print in their midst (Kuby, Goodstadt-killoran, Aldridge, & Kirkland, 1999). If children understand that a sign is meant as a representation of something else, they can sometimes correctly interpret a sign's meaning (Magnusson & Pramling, 2011; Apperly, Williams, & Williams, 2004; Tolaret al., 2008; Brereton, 2010). Studies indicate that teaching signs to learning disabled children helps them understand the world around them (Apperly, Williams, & Williams, 2004; Bialystok, 2000).

Indeed, some teaching methods used with hearing impaired children employ the use of pictures. Research shows that using pictures is a step toward literacy (Pettersson, 1983; Hsiao & Chang, 2016). Specifically, children with hearing impairments can develop language easier when teachers use pictures to convey meanings or give instructions (Moss, 1995; Thompson, 2017).

In addition to learning to read, exposure to pictures also helps children develop imagination and creativity. One study found that adding pictures to textbooks enhanced the children's learning and creativity (Kasmaenezhadfard, Pourrajab, & Rabbani, 2015). Children who have not yet learned to read or write can benefit greatly from environmental print, relying on signs and pictures instead of words to receive messages (Rottenberg & Searfoss, 1992).

Question 2 asked children where they see the signs that they recognized. Children reported seeing the signs in the hospital, the street, school, parks, home, the pharmacy, wood posts, and at the mall. This result is expected, since children can remember things they see with frequency in their environment. Bronfenbrenner's model shows the importance of environmental factors in learning (Bronfenbrenner, 1989). This result is also consistent with previous research that found that children recognize the meaning of signs that are most common in their environment (Ahmad, Al-Zboon, & Dababneh, 2018; Brereton, 2010; Cooper, 2002; Daniels, 2001; Tolar, Lederberg, Gokhale, & Tomasello, 2008). Moreover, it has been found that children with hearing impairments would learn most from what they see. This is similar to children without hearing impairments, so the same teaching

methods could mostly be used for both (Moss, 1995).

Question 3 asks children to guess at what they think the meaning of a sign is when they do not know its true meaning. Children's responses to this question are varied. For example, the sign for mosque, church, and school was identified by some as a house. Some also identified the sign for church as a "beautiful house." This indicates that the children apply how they feel about the sign to its meaning. For the sign for school, a response was "children running," which indicates they see the sign for what it appears the children are doing, not as a place for teaching children. Similarly, for the Hospital sign, children identified the "H" as a ladder, looking at the shape of the sign instead of recognizing it as a letter. Another sign taken more literally was that of bathroom for men and women. Children would identify the sign as "boy wearing pants" or "girl wearing a skirt" or "girl with one leg". For a private bathroom for the disabled, responses were "Boy, girl, and chair" and "boy and girl sitting on the street" and "wheel chair." Children were describing the picture and not understanding that the picture was a sign representing something else. For guided signs, Exit was interpreted as "someone walking". Gas station was "water for car" or "box". Pharmacy was "snake and plate" or "snake and big cup". A path for people with special needs was identified as "a child in the chair" and "a man sitting on a street." Parking for people with special needs was identified as "walking," "a car outside" or "a cart for people with special needs". Airport was identified as "a plane" or "stick with a line". The elevator sign was identified as "standing men" and "boy up and down". These examples show that children take the picture literally when they do not understand that it is a sign or what it represents.

Warning signs such as Danger – Electricity or Do Not Approach were also described literally as "light," "Headphone and Earphone" or "Head and Bone." The children described the sign for No Swimming as "water" or "man is swimming" or "man flies". For No Photography Allowed, children said "camera" or "Image and circle". For No Smoking, they similarly identified the sign literally as "smoke and circle" and "water" or "tea". These responses indicate the children are using their imaginations and prior knowledge to guess the meaning of a sign. For the stop sign, children said "street" or "sticker" or "electricity" meaning they are guessing at what they see, but have no prior knowledge of these signs. It is also not surprising that children relate the stop sign to what they do have prior knowledge of. They assign "sticker" or "electricity" or "street" to a stop sign because these are items they do know, but they do not understand that a stop sign is related to driving. This indicates that children differ in how they think, imagine, or see a sign.

Previous research shows that children start to recognize some signs at age 2.5 years, and master sign interpretation by 5, and at that point can usually accurately guess the meaning of a sign if they do not know it already (Tolar, et. al , 2008). A prior study also showed that signs showing an action were easier to identify than signs of features(Tolar, et. al, 2008). The results were consistent with that of children without hearing impairments (Acredolo&Goodwyn, 1988; Ahmad, et al., 2018; Thompson, 2017).

## 5. Conclusion

In sum, this study showed that hearing impaired children can most easily recognize iconic signs and struggle to correctly identify index and symbol signs. The results are consistent with prior studies that also showed children can most easily recognize iconic signs. More notable in this study is that hearing impaired children did not understand that a sign is a representation of something else. They thought the sign was meant to be a literal picture. This shows that the children lack the knowledge of environmental print in their midst. Children cannot inherently interpret signs (Brereton, 2010). Results of another study testing sign recognition of children without hearing impairment were similar to the current study in that the children struggled to identify what signs represented (Ahmad, et al., 2018).

Hearing impaired children need more help from others to identify signs and then learn their meaning, especially given that they cannot hear anyone around them who may be speaking the sign's

meaning as they are viewing it. The first step is to call the children's attention to the signs around them, and then explain the purpose of the sign. This can encourage children's curiosity to spot signs on their own and ask what the signs mean. This keeps children safe, and also helps them engage in the environmental print around them.

Results from the study also showed that children who could correctly identify a sign's meaning also could state all the places they'd seen the sign before. This makes sense because frequent exposure to the same sign makes it easier to learn and remember.

Moreover, children gave different meanings to the signs they did not recognize. Their answers show that they did not understand that the sign was a representation of something else. Their responses showed how they imagine, think, and feel, but lacked an appreciation for the function of the sign to give knowledge or warn of danger. This is important for those who work with hearing impaired children to understand the importance of teaching about signs. Teachers and parents can call attention to common signs found in the environment and explain their meaning to children. In this way, children may learn to start spotting signs on their own and ask questions about the signs' meaning. It helps children interpret the world around them.

## 6. Limitations, Implications and Future Research

Like any study, this study had limitations. There are many centers for children with hearing impairments throughout Jordan, and the study was limited to one center in Al-Zarqa city. Hence, not all hearing impaired children in Jordan may experience the same results, and findings may differ in other cities.

Future studies could examine more signs and a larger sample of children with hearing impairments. Studies could also be done in other countries and findings compared.

The study indicates that educators could use public sign recognition in their lessons. Workshops for teachers could help them use different strategies to teach these children about these common signs around them and motivate them to ask questions when they see any sign in their environment.

Considering the learning environment of hearing impaired children, it is important for teachers to draw children's attention to signs in the classroom or school building and teach them the function of signs. Teachers could include lessons in their curriculum that are about the meanings of common signs. They could also arrange games and activities, or provide children with books that involve learning sign meanings. During field trips, teachers could ask children to look for new signs, and then ask the children to draw the signs and discuss where they see the signs. Visual strategies such as putting signs in the classroom will provide stimulus for both hearing impaired and normal hearing children.

## References

- Acredolo, L. P., & Goodwyn, S. W. (1988). Symbolic gesturing in normal infants. *Child Development*, 59, 450-466.
- Ahmad, J., Al-Zboon, E., & Dababneh, K. (2018). Children's recognition of pictorial signs and symbols. *Early Child Development and Care*, 188(6), 679-690.
- Al-Zboon, E. (2016). Kindergarten curriculum for children with hearing impairments: Jordanian teachers' perspectives. *Deafness & Education International*, 18(1), 38-46.
- Al-Zboon, E. K. (2017). Current state of the curriculum in Jordanian kindergartens for children with hearing impairments. *Early Child Development and Care*, 187(11), 1760-1770.
- Apperly, I. A., Williams, E., & Williams, J. (2004). Three- to Four-Year-Olds' Recognition That Symbols Have a Stable Meaning: Pictures Are Understood Before Written Words. *Child Development*, 75(5), 1510-1522.
- Apperly, I. A., Williams, E., & Williams, J. (2004). Three-to four-year-olds' recognition that symbols have a stable meaning: Pictures are understood before written words. *Child Development*, 75(5), 1510-1522.



- Aram, D., Korat, O., Saiegh-Haddad, E., Arafat, S. H., Khoury, R., & Elhija, J. A. (2013). Early literacy among Arabic-speaking kindergartners: The role of socioeconomic status, home literacy environment and maternal mediation of writing. *Cognitive Development, 28*(3), 193-208.
- Bialystok, E. (2000). Symbolic representation across domains in preschool children. *Journal of experimental child psychology, 76*(3), 173-189.
- Brereton, A. (2010). Is Teaching Sign Language in Early Childhood Classrooms Feasible for Busy Teachers and Beneficial for Children? *YC: Young Children, 65*(4), 92-97.
- Briggle, S. J. (2005). Language and Literacy Development in Children Who are Deaf or Hearing Impaired. *Kappa Delta Pi Record, 41*(2), 68-71.
- Bronfenbrenner, U. (1989). Ecological systems theory. In R. Vasta (Ed.), *Annals of child development*, Vol. 6 (pp. 187-252). Greenwich, CT: JAI Press.
- Chimedza, R. and Peters, S. (2001). Disabilities and Special Needs Education in an African Setting. Harare: College Press.
- Cooper, B. (2002). The Use of Sign Language to Teach Reading to Kindergartners. *Reading Teacher, 56*(2), 116-19.
- Daniels, M. (2001). Dancing with words: Signing for hearing children's literacy. Westport, CT: Bergin & Garvey.
- Dearborn, F. R. (1928). *The Road to Citizenship*. Ginn.
- Dewey, J. (1938/2008). "Logic: The Theory of Inquiry". The Later Works of John Dewey, volume 12. Carbondale: Southern Illinois University Press.
- El-Zraigat, I. (2011). Assessing reading skills among hearing-impaired students in Jordan and its relation to some variables. *Derassat, 38*(3), 1276-1292.
- Ferguson, C. A. (1959). Diglossia. *word, 15*(2), 325-340.
- Fingon, J. C. (2005). The Words That Surround Us. *Teaching Pre K-8, 35*(8), 54-55.
- Giles, R. M., & Tunks, K. W. (2010). Children write their world: Environmental print as a teaching tool. *Dimensions of Early Childhood, 38*(3), 23-29.
- Goodman, Y. M., & Altwerger, B. (1981). Print awareness in pre-school children. University of Arizona, Arizona Center for Research and Development.
- Hardman, M. I. Drew, G. L. and Egan, M. W. (2005). Human Exceptionality in Society, School and Family. Boston: Allyn and Bacon.
- Hsiao, C. Y., & Chang, Y. M. (2016). A Study of the Use of Picture Books by Preschool Educators in Outlying Islands of Taiwan. *International Education Studies, 9*(1), 1-19.
- Hsiao, C. Y., & Shih, P. Y. (2015). The impact of using picture books with preschool students in Taiwan on the teaching of environmental concepts. *International Education Studies, 8*(3), 14-23.
- Kasmaiezhadfar, S., Pourrajab, M., & Rabbani, M. (2015). Effects of pictures in textbooks on students' creativity. *Multi Disciplinary Edu Global Quest (Quarterly), 4*(2), 14.
- Kuby, P., Goodstadt-Killoran, I., Aldridge, J., & Kirkland, L. (1999). A review of research on environmental print. *Journal of Instructional Psychology, 26*(3), 173-182.
- Langer, S. K. (2009). *Philosophy in a new key: A study in the symbolism of reason, rite, and art*. Cambridge, MA: Harvard University Press.
- Magnusson, M., & Pramling, N. (2011). Signs of Knowledge: The Appropriation of a Symbolic Skill in a Five-Year-Old. *European Early Childhood Education Research Journal, 19*(3), 357-372.
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons.
- Miller, L. (1995). 'I can read that. It says 'HAPPY SHOPPER'--The Role of Environmental Print in Early Literacy Development. *Early Years, 16*(1), 20-26.
- Moore, D. F. (1996). Educating the deaf: Psychology. *Principles and Practices (4th Edition)* New Jersey: Houshton Mifflin Company.
- Moss. (1995). Teaching Strategies and Content Modifications for the child with Deaf- Blindness. Edition of P.S.News
- Nelson, K. (2009). External representations critical to human intelligence: Reflections on the volume. In *Representational systems and practices as learning tools* (pp. 297-313). Brill Sense.
- Neumann, M. M. (2018). The effects of a parent-child environmental print program on emergent literacy. *Journal of Early Childhood Research, 16*(4), 337-348.
- Neumann, M. M., Hood, M., & Ford, R. M. (2013). Using environmental print to enhance emergent literacy and print motivation. *Reading and Writing, 26*(5), 771-793.
- Paisley, P. O., & Reeves, P. M. (2001). Qualitative research in counseling. In D. C. Locke, J. E. Myers, & E. L. Herr (Eds.), *The handbook of counseling* (pp. 481-498). Thousand Oaks, CA: Sage.
- Peirce, C. S. (Ed.). (1883). *Studies in logic. By members of the Johns Hopkins university*. Little, Brown.



- Pettersson, R. (1983). Visuals for Instruction (CLEA-Report No. 12). Stockholm: University of Stockholm, Department of Computer Science.
- Pietrandrea, P. (2002). Iconicity and arbitrariness in Italian sign language. *Sign Language Studies*, 2, 296-321.
- Retnowati, G., Salim, R. M. A., & Saleh, A. Y. (2018). Effectiveness of Picture Story Books Reading to Increase Kindness in Children Aged 5-6 Years. *Lingua Cultura*, 12(1), 89-95.
- Rottenberg, C. J. (2001). A deaf child learns to read. *American annals of the deaf*, 146(3), 270-275.
- Rottenberg, C. J., & Searfoss, L. W. (1992). Becoming literate in a preschool class: Literacy development of hearing-impaired children. *Journal of Reading Behavior*, 24(4), 463-479.
- Rottenberg, C. J., & Searfoss, L. W. (1993). How hard-of-hearing and deaf children learn their names. *American annals of the deaf*, 138(4), 358-361.
- Saiegh-Haddad, E. (2003). Linguistic distance and initial reading acquisition: The case of Arabic diglossia. *Applied Psycholinguistics*, 24(3), 431-451.
- Schick, B. (2006). Acquiring a visually motivated language: Evidence from diverse learners. In B. Schick, M. Marschark, & P. E. Spencer (Eds.), *Advances in the sign language development of deaf children* (pp. 102-134). New York: Oxford University Press.
- Stephen, A., & Mathur, G. (2012). Bringing the Field into the Classroom: A Field Methods Course on Saudi Arabian Sign Language. *Sign Language Studies*, 13(1), 37-55.
- Taub, S. F. (2001). *Language from the body: Iconicity and metaphor in American Sign Language*. Cambridge, UK: Cambridge University Press.
- Teubal, E., Dockrell, J., & Tolchinsky, L. (2007). *Notational knowledge: Developmental and historical perspectives*. Rotterdam: Sense.
- Thompson, R. L., England, R., Woll, B., Lu, J., Mumford, K., & Morgan, G. (2017). Deaf and hearing children's picture naming: Impact of age of acquisition and language modality on representational gesture. *Language, Interaction and Acquisition*, 8(1), 69-88.
- Tolar, T., Lederberg, A., Gokhale, S., & Tomasello, M. (2008). The development of the ability to recognize the meaning of iconic signs. *Journal of Deaf Studies & Deaf Education*, 13(2), 225-240.
- Tulk, S. (2005). Reading picture books is serious fun. *English Teaching: Practice and Critique*, 4(2), 89-95.
- Wilcox, S. (2004). Cognitive iconicity: Conceptual spaces, meaning, and gesture in signed languages. *Cognitive Linguistics*, 15(2), 119-147.
- Williams, C. B., & Finnegan, M. (2003). From myth to reality: Sound information for teachers about students who are deaf. *Teaching Exceptional Children*, 35(3), 40-45.