



The Effect of Peer-Mediated Picture Exchange Communication System Intervention in Improving Vocabulary Knowledge in Children with Autism Spectrum Disorders

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Abstract

Autism is a disability characterized by impaired social interactions, limited verbal and nonverbal communication, and restricted and repetitive patterns of behavior. Children with autism may not make friends, spend more time alone than with others, and may not develop empathy or other forms of social reciprocity. This study explores the effect of peer-mediated picture exchange communication system intervention in improving vocabulary knowledge in children with autism spectrum disorders. Participants were ten children aged seven, attended a center for children with autism. A pre-post design was used to examine the effect of peer-mediated picture exchange communication system intervention in improving vocabulary knowledge in children with autism spectrum disorders. Findings from this study advocated for the effect of peer-mediated picture exchange communication system intervention in improving vocabulary knowledge in children with autism spectrum disorders.

Keywords: peer-mediated, Picture Exchange Communication System, vocabulary knowledge, children with autism spectrum disorders.

Introduction

Autism is a disability characterized by impaired social interactions, limited verbal and nonverbal communication, and restricted and repetitive patterns of behavior. Children with autism may not make friends, spend more time alone than with others, and may not develop empathy or other forms of social reciprocity. They may exhibit stereotypical behaviors to the exclusion of all other activities, may engage in echolalia if any speech at all, and may also engage in dangerous behaviors such as aggression or self-injury (Adel Abdulla & Mourad Ali, 2014).

Language difficulties commonly occurring within the spectrum include using only nonverbal forms of communication, having delayed speech, participating in the use of echolalia, using only single words to communicate, and exercising other abnormalities in the use of language. These difficulties often contribute to many of the behavioral issues observed in ASD because the individuals become frustrated with the task of trying to portray the appropriate message to others (Mourad Ali Eissa, 2015)

Fahey and Reid (2000) further discussed the implications of ASD on the development of communication characteristics. Some children may produce words in early infancy but experience regression in their language between 18 and 30 months. This can, most likely, be attributed to the variation of disorders found along the spectrum. The authors noted that approximately 50 percent of individuals diagnosed with ASD would never develop functional language production. Characteristics observed in those individuals who do learn to speak may include:

(a) the use of echolalia (i.e. immediate or delayed repetition of part or all of someone else's language); (b) improper use of pronouns to refer to self (e.g., .you,. .she,. .he.); (c) repetitive speech without apparent functional value; (d) monotonous inflection, rhythm, pitch, rate, and articulation; (e) confusion in grammar and meanings; and (f) impaired understanding of nonverbal gestures, facial expressions, and physical distance from others (see Mourad Ali Eissa, 2015,P.4).

The picture exchange communication system (PECS) is a pictorial system that was developed for children with social-communication deficits (Frost & Bondy, 2002). It has six phases that include (a) physical exchange, (b) expanding spontaneity, (c) picture discrimination, (d) sentence structure, (e) answering a direct question and (f) commenting. Physical exchange involves the child exchanging a picture of a preferred item for the tangible

preferred item. Expanding spontaneity involves increasing the distance between the child and the communication partner when making requests for preferred items. Picture discrimination involves the child choosing between multiple pictures on the board when requesting an item. Sentence structure involves the child making a sentence with a picture of “I want” and a picture of the preferred item in order to request. Answering a direct question involves the child answering the question, “What do you want?” with the sentence learned from sentence structure. Commenting involves the child commenting on their environment with specific attributes, such as shape and colour (Strasberger, 2013).

Ganz & Simpson (2004) examined the effects of the PECS on the requesting behaviors and speech development of three young students with an ASD. The PECS training took place two to five times per week, with 15 trials occurring per session until participants were able to reach 80% proficiency independently for three consecutive 15 min trials. Data were taken on non-word and word vocalizations, as well as the proficiency relative to the PECS phase criteria. Participants were taught phases one to four of the PECS. Results indicated that the PECS was mastered quickly by the participants (as in previous studies) and word vocalizations increased in the number of words and the complexity of grammar.

Using a multiple baseline design, Marjorie et al. (2002) examined the acquisition of PECS with 3 children with autism. In addition, the study examined the effects of PECS training on the emergence of speech in play and academic settings. Ancillary measures of social-communicative behaviors and problem behaviors were recorded. Results indicated that all 3 children met the learning criterion for PECS and showed concomitant increases in verbal speech. Ancillary gains were associated with increases in social-communicative behaviors and decreases in problem behaviors. The results are discussed in terms of the provision of empirical support for PECS as well as the concomitant positive side effects of its use.

El Farahati Elsayed Mahmoud (2015) explored the effectiveness of Picture Exchange Communication System has positive effects functional communication of children with autism. Participants were ten children between the ages of five and seven who attended a school for children with developmental disabilities (Tarbya Fekrya). A pre-post design was used to examine the effectiveness of the Picture Exchange Communication System on functional communication of the target children. Findings from this study indicated the effectiveness of the Picture Exchange Communication System employed in teaching the target children functional communication. On the basis of the findings, the study advocated for the effectiveness of the Picture Exchange Communication System employed in teaching the target children functional communication.

Peer-Mediated Interventions

Peer-mediated interventions are generally classified into six dimensions which include (a) peer modeling, (b) peer initiation training, (c) peer monitoring, (d) peer networking, (e) peer tutoring, and (f) group-oriented contingencies (Strasberger, 2013). Peer-mediated intervention requires the teacher to design and train a peer or peers to deliver instruction that is often designed to address social or academic skills. The role of the target child is to respond to peers’ initiations to gain needed skills. In particular, studies have indicated the use of peers as role models has the potential to be more advantageous than teachers for teaching and modeling social behaviors (Kathleen I. Harris, 2010).

The purpose of the present study was to the effect of peer-mediated picture exchange communication system intervention in improving vocabulary knowledge in children with autism spectrum disorders. The primary research question was, what effect will peer-

mediated picture exchange communication system intervention have on improving vocabulary knowledge in children with autism spectrum disorders?

Method

Participants

Participants were ten children aged seven, attended Misr Institute for Autism and Special Needs. Parental informed consent forms were sent home by the specialist to parents of potential participants telling them about the study and requesting them to give permission for their children to participate. Through a previous comprehensive psychological evaluation each targeted child had received a primary diagnosis of Autistic Disorder.

Instrument

Pictured Vocabulary Test: A measurement instrument was specifically developed for the study to measure vocabulary ability in children with autism. The test consists of 22 pictures, presented to the child individually by the researchers. The child in return names the picture. The total scores for the test range from 0-22. Correlation coefficient between the test and Verbal communication questionnaire in the Diagnostic Scale for Autism Disorder (Ade; Abdalla, 2001) was (0.87).

Procedure

The PECS training consists of six phases, which will be described in detail in the following. *Phase I*– “How” to Communicate. In this phase, the terminal objective is that upon seeing a “highly preferred” item, the child will pick up a picture of the item, reach toward the communicative partner, and release the picture into the trainer’s hand (Frost & Bondy, 2002, pp. 67). One trainer entices the child with an object that is highly desired. As the child reaches for the desired object, the second trainer, the facilitator, physically assists the child in picking up a picture for the desired object. The first trainer immediately gives the child a reward along with an appropriate comment, such as “Oh, you want M&M!” when he/she receives the picture.

Phase II – Distance and Persistence. In this stage, the exchange continues with attempts to increase the child’s independence. Thus, the terminal objective is that the child goes to his communication book where his picture is stored, pulls the picture off, goes to the trainer, gets the trainer’s attention, and releases the picture into the trainer’s hand (Frost & Bondy, 2002, pp. 93). The child now is encouraged to use greater spontaneity and persistence, and to generalize the skill he acquired. The facilitator is still available for as needed assistance. Thus, the child learns to remove the picture from a display board for the exchange and must engage in more physical movement than in Phase I in order to accomplish the exchange. However, the child is still encountering only one symbol on a board at any one time.

Phase III – Picture Discrimination. The terminal object for this phase is that the child requests desired items by going to a communication book, selecting the appropriate pictures from an array, and going to a communication partner and giving him/her the picture (Frost & Bondy, 2002, pp.123). In this stage the child is asked to discriminate between several items on a board, choosing which item he wants, or which activities he wants to try. The child begins by answering forms of the question “What do you want?” but these are faded quickly so the child will make choices spontaneously as well as in response to a question. As the child becomes more comfortable making discriminations, a third item may be added, and so on.

Phase IV – Sentence Structure. The terminal objective is that the child requests present and non-present items using a multi-word phrase by going to the book, picking up a picture/symbol of “I want,” putting it on a sentence strip, picking out the picture of what she wants, putting it on the sentence strip, removing the strip from the communication board, and finally approaching the communicative partner and giving the sentence strip to him (Frost & Bondy, 2002, pp.159). Thus, the child is taught to combine the object picture with the carrier phrase “I want” on a sentence strip and to give the strip to the adult or communication partner. The two pictures are attached to a sentence strip and the entire strip is exchanged with the communicative partner in return for the pictured item.

Phase V – Responding to “What do you want?” In this stage the child learns to respond to the question “What do you want?” by exchanging the sentence strip. Thus, this phase extends the sentence structure begun in Phase IV. Use of the questioning phrase is deliberately delayed until this phase because the exchange behavior should be automatic by that point in the programming sequence (Frost & Bondy, 2002, pp. 209). Adjectives and other words may be added to the child’s repertoire to help her further refine her requests.

Phase VI – Commenting. In this final stage, the child learns to respond to the questions “What do you want?” “What do you see?” “What do you have?” This phase makes a fundamental shift in the child’s communication as well as the expected outcome from the teachers or peers. That is, it is designed to introduce the child to commenting behavior, while the previous stages focused on requesting behavior. Through the use of pictures for “I see,” “I hear,” “I smell,” etc., the child is taught to comment on elements of his/her environment.

Results

The first objective of the study was to determine if use of peer-mediated picture exchange communication system intervention would be more effective in improving vocabulary knowledge for the treatment group compared to the control group. For this purpose, the post intervention scores of both treatment and control groups were analyzed. Table 1. shows Z Value result for the differences in post-test mean rank scores between experimental and control groups in vocabulary knowledge. The table shows that (Z) value was(-2.271). This value is significant at the level (0.01) in the favor of experimental group.

Table 1. Z Values results for the differences in post-test mean rank scores between experimental and control groups in vocabulary knowledge

Variables	Groups	N	Mean Ranks	Sum Ranks	Mann-Whiten	Z Value	Sig
vocabulary knowledge	Ex	5	8	40	Zero	-2.271	0.01
	Cont.	5	3	15			

The second objective of the study was to determine the effect of peer-mediated picture exchange communication system intervention in improving vocabulary knowledge in children with autism.

The children’s performance on vocabulary knowledge was measured pre and post intervention. Table 2 shows Z Value result for the differences in pre and post-test mean rank scores for the experimental group in vocabulary knowledge test. The table shows that (Z) value was(-2.121). This value is significant at the level (0.01). This indicates that use of peer-mediated picture exchange communication system intervention had a positive effect on vocabulary knowledge in children with autism.

Table 2. Z Values results for the comparison of mean rank scores of experimental group at pre- and post-intervention in vocabulary knowledge

Variables	Negative Ranks		Positive Ranks		Z Value	Sig.
	Mean	Sum	Mean	Sum		
vocabulary knowledge	3	15	Zero	Zero	-2.121	0.01

Discussion

The purpose of the present study was to the effect of peer-mediated picture exchange communication system intervention in improving vocabulary knowledge in children with autism spectrum disorders. The primary research question was, what effect will peer-mediated picture exchange communication system intervention have on improving vocabulary knowledge in children with autism spectrum disorders?

Findings from the present study indicate peer- mediated picture exchange communication system intervention was an effective intervention strategy in improving vocabulary knowledge in children with autism spectrum disorders

These findings support the use of PECS by providing the first empirically controlled data on the PECS program. We encourage the evaluation of PECS and the continued pursuit of visually presented speech training programs for children with autism.

Limitations of the Study

The first limitation of this study is that the sample was small. The study was also limited in that it lacked a maintenance or generalization phase, which would add robustness to the findings. The dependent variable was narrow in that only the impact of peer- mediated picture exchange communication system intervention on a single vocabulary knowledge was examined. Future research needs to be conducted on large sample, more variables, and the need for maintenance and generalization phases.

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