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Using an adapted form of the Picture Exchange Communication System to increase independent requesting in deafblind adults with learning disabilities



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ABSTRACT

The current study assessed the effectiveness of an adapted form of the Picture Exchange Communication System (PECS) in increasing independent requesting in deafblind adults with learning disabilities. PECS cards were created to accommodate individual needs, including adaptations such as enlarging photographs and using swelled images which consisted of images created on raised line drawing paper. Training included up to Phase III of PECS and procedures ensuring generalizations across individuals and contexts were included. The effects of the intervention were evaluated using a multiple baseline design across participants. Results demonstrated an increase in independent requesting with each of the participants reaching mastery criterion. These results suggest that PECS, in combination with some minor adaptations, may be an effective communicative alternative for individuals who are deafblind and have learning impairments.

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1. Introduction

The Picture Exchange Communication System (PECS) was initially developed in 1985, to offer children with autism spectrum disorder (ASD) a functional way to communicate (Bondy & Frost, 1994). Since then, PECS has been widely recognised as a useful, if not essential, tool in teaching core communication skills to non-verbal children or those with ASD (Charlop-Christy, Carpenter, LeBlanc, & Kellet, 2002; Ganz, Simpson, & Corbin-Newsome, 2008; Kravits, Kamps, Kemmerer, & Potucek, 2002; Yokoyama, Naoi, & Yamamoto, 2006).

The majority of PECS research has centred on children with ASD but there is increasing evidence of its successful application with developmental disabilities other than ASD (Beukelman & Mirenda, 1998; Bondy & Frost, 1994; Conklin & Mayer, 2010; Schwartz, Garfinkle, & Bauer, 1998). Stoner et al., 2006 demonstrated success with the use of PECS for non-speaking adults with developmental disabilities and similar results for adult populations have also been observed by Rosales and Rehfeldt (2007) and Ziomek and Rehfeldt (2008). In 2010, Hart & Banda conducted a meta-analysis of single-subject studies where PECS was the intervention employed with individuals with developmental disabilities. Their findings indicated that PECS increased functional communication across a variety of ages disabilities, and communication levels. A number of the studies they reviewed also found that the use of PECS decreased the frequency of challenging behaviours such as aggression (Buckley & Newchok, 2005), tantrums, and out of seat behaviour (Charlop-Christy et al., 2002; Frea, Arnold, & Vittimberga, 2001). Approximately half of the studies they reviewed reported some level of generalisation of interventions

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employing PECS. Generalisation was shown to occur over settings such as fast-food restaurants (Stoner et al., 2006) and in the participants home (Chambers & Rehfeldt, 2003), across people (Bock, Stoner, Beck, Hanley, & Prochnow, 2005; Tincani, 2004) and across items (Charlop-Christy et al., 2002).

Traditionally, a PECS program incorporates the use of visual pictures. More recently however, a number of researchers have recognised the importance of adapting PECS materials and procedures to meet more specific needs of the individual (Carr & Felce, 2007; Cummings, Carr, & LeBlanc, 2012; Lund & Troha, 2008; Parker, Davidson, Griffin, & Banda, unpublished doctoral dissertation). In an experimental evaluation of the PECS training procedure, Cummings et al. (2012) found that for some participants, procedural modifications were required in order to reach target behaviours in particular phases. Carr and Felce (2007) employed an abbreviated version of the PECS training up to Phase III only and found that communications between autistic children and their teachers increased significantly. Malandraki and Okalidou (2007) used an adapted form of PECS with a child with ASD who was also hearing impaired. They implemented training for four months up to Phase VI. This included maintenance and follow up phases four months following training. A preference assessment was carried out to establish preferred items and matching cards were then created. Phases I–V required between 4 and 20 sessions for participants to reach mastery criterion of 80% independent requesting. Overall results demonstrated an increase in functional communication. Changes were also observed in the participant's psychosocial development and included a reduction in stereotypic autistic behaviours. Although this study demonstrated initial success with PECS for hearing impaired individuals, the findings were limited in that there was a lack of independence in data collection by the two trainers. In addition, as the findings were based on a case study, there is a need for replication with more than one individual.

Other studies have made some adaptations to the PECS procedure to match the specific needs of individuals with visual impairments and ASD (Lund & Troha, 2008; Parker et al., unpublished doctoral dissertation). Deafblind individuals do not benefit from a visual communication system and therefore a more tangible alternative must be sought. Rowland and Schweigert (1989) found that objects were beneficial for the deafblind, whereas Turnell and Carter (1994) originally explored the use of tangible symbols. In their study they trained an individual with multiple disabilities to request by simply reaching for the symbol. Results showed that the participant acquired the use of three symbols to request and generalisation occurred across objects. According to Turnell and Carter (1994) using tangible items allows a direct means to request items that are not physically present.

Lund and Troha (2008) also extended the findings of previous studies by using a multiple baseline design with 3 participants who had ASD and both a learning and visual impairment. The results showed that only one of the participants reached mastery for Phase II whereas the other two participants indicated only small increases from baseline values. These limited results may have been due to the time restrictions of the study as all training was conducted within 30 sessions. In addition, the authors discuss the possible implications of the participants' cognitive and language levels and the use of a verbal prompt which may have impacted on their acquisition rates.

A pilot study by Parker, Banda, Davidson, and Liu-Gitz (2010) extended these findings by including multiple symbols in their study. In addition they aimed to generalise the results to multiple contexts. A changing-criterion design was used to evaluate PECS with a seven-year-old boy with ASD who was visually impaired. Object parts were used as PECS cards. Each of the objects was glued to a square and Braille labels were placed on the squares. Using this adapted form of PECS the participant mastered Phase IV within 21 intervention sessions and with the use of 23 symbols. The results also generalised to other contexts and trainers. The purpose of the current study was to train three adults with deafblindness and learning disabilities to use an adapted form of PECS and to measure its efficacy using the percentages of independent requests. In particular, this study aims to extend previous research by focusing on deafblind adults whilst assessing for generalisation of acquired skills to other contexts and communicative partners.

2. Method

2.1. Participants

Three deafblind individuals with intellectual disabilities participated in the present study. Participants' ages ranged from 30 to 39 years of age. All of the participants were selected from a residential centre based on their dual sensory impairments and lack of functional communication. Due to the visual impairments and the cognitive abilities of the participants, a variation of deaf blind sign language was used in combination with an Irish Sign Language called 'Lámh'. Lámh is a manual sign system used by children and adults with intellectual disability and communication needs in Ireland. It may be used with other types of communication and communication support such as gesture, pictures, and/or other systems, as part of a total communication approach. Not all of the clientele in the setting had the cognitive ability to use deaf blind sign language or were never exposed to it so traditionally they were taught to use 'Lámh'.

Participant 1 was a 30-year-old male who was completely blind and deaf since childhood as a result of Genital Rubella Syndrome. He was diagnosed as having a moderate learning disability but this was only estimated due to the lack of assessment tools available for the deafblind. This participant used a combination of some deaf blind sign language and 'Lámh' alongside raised swell cards as communication tools, although would rarely initiate communication and requests were mostly prompt dependent.

Participant 2 was a 39-year-old male with a diagnosis of CHARGE syndrome. This is a genetic condition which can lead to a set of birth defects including heart defects and breathing problems. Most individuals with CHARGE syndrome also have

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