Facilitating Communication with a Congenitally Deafblind Child by Imitation of a Repetitive Routine

The authors of this article aim to show how imitation can be used in developing communication with individuals with deafblindness. Using a case study of a twelve year old girl who has some residual hearing they examine how verbal imitation of a repetitive sign sequence used by the child led to the development of her communication and language.

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INTRODUCTION

Congenital deafblindness involves significant impairment of both vision and hearing from birth or early childhood. The precise degree of sensory loss varies, the resulting heterogeneity limiting research in this area (Ronnberg and Borg, 2001). The dual sensory deficit is generally prelingual and profoundly affects the potential for communication. Since much of early parent–child interaction preceding language utilises visual and auditory channels, from infancy there is a "mismatch between the immediate behaviour repertory of the congenitally deafblind child and the reactive behaviours of the adult partner" (Nafstad and Rødbroe, 1997, pp. 165-166). This mismatch is arguably a greater obstacle to the attempt to acquire language than the sensory deficits themselves (Hart, 2008) and overcoming the mismatch is a key objective of communication strategies for deafblind people. As Hart (2006) notes, "all congenitally deafblind people are potential communication partners. The key question…is how to help them achieve that potential" (p. 264). To begin with, the mismatch that constrains early interaction must be re-aligned and, to this end, there is a need for a communication partner to be able to respond to communicative attempts that appear in a variety of forms (Bruce, 2003; O'Neill, Jones and Zeedyk, 2008; Deasy and Lyddy, in press), including, in some cases, in the form of repetitive behaviours or apparent stereotypes (Murdoch, 1997). One way in which this might be achieved is through imitation of extant patterns of behaviour. This paper examines the use of imitation in supporting communication with a deafblind child, and discusses how this single subject case might inform research in this area (Parker, Davidson and Banda, 2007).

IMITATION AND THE SOCIAL BASIS OF LANGUAGE

Language emerges from social interaction between an infant and a caregiver (Vygotsky, 1962; Bruner, 1975a; Bruner 1975b; Vygotsky, 1978). In these early interactions, routines between adult and child establish expectations that support language development. Initially non-verbal patterns of turn-taking, shared attention and imitation

(Bruner, 1983), these routines increase responsiveness of infants (Camaioni and Lacardi, 1985) and later support verbal communication. Repetitive sequences of interaction featuring nursery rhymes, songs or social games (such as 'peek-a-boo') are common, as are non-conventional routines that are particular to parent and child. Imitative sequences are a key part of these early interactions (Meltzoff and Moore, 1977), and support the recognition of intersubjectivity and the development of a 'theory of mind' (Obermann and Ramachandran, 2007). Such behaviours lay the ground-rules for conversational turns and align the social expectations of child and caregiver.

Imitation is a milestone in the development of symbolism or the abstract representation that underpins language (Bruce, 2005). Routines using imitation or repetition have been used to support communication with children with learning or communication disabilities and the ability to imitate is a recognised cognitive strength (Reilly and Senior, 2007). Wimpory Hobson and Nash (2007) found that social routines involving self-repetition and imitation of the child (via actions or vocalisations) preceded periods of social engagement (e.g. eye contact) in children with autism (Dawson and Adams, 1984; Lewy and Dawson, 1992; Davies Zeedyk, Walls, Betts and Parry, 2008; O'Neill et al., 2008). They found that actions that continue a child's activity, rather than re-direct focus, are more effective (Wimpory et al., 2007). Nadel, Croué, Mattlinger, Canet, Hudelot, Lecuyer, and Martini (2000) found that an imitating adult had a notable and immediate effect on the behaviour of children with autism, and helped to form social expectations. There may be particular importance attached to the imitation of infants by their caregivers (Heyes, 2005, cited in McEwen, Happé, Bolton, Rijsdiik, Ronald, Dworzynski, and Plomin, 2007) a role assignment that is common when considering children with learning difficulties (that is, they are more likely in such interactions to be imitated than to imitate; Davies et al., 2008). The child's ability to imitate an adult is also informative and may predict language outcome in autistic children (Toth, Munson, Meltzoff and Dawson, 2006). Imitation is used in a number of interactive (or reciprocal) communication strategies for those with communication difficulties, including intensive interaction (Ephraim, 1986; Caldwell, 2006) and co-creative communication (Nafstad and Rødbroe, 1999).

THE FUNCTIONS OF IMITATION FOR DEAFBLIND CHILDREN

The term 'imitation' generally refers to the reproduction from *vision* of a body movement of another or the "copying by an observer of a feature of the body movement of a model" (Heyes, 2001, p. 254). In the present paper, imitation is treated as a response which follows from a person's behaviour, and which is broadly representative of the form or content of that behaviour. We note Caldwell's (2006) distancing of the term 'imitation' from connotations of mimicry, and her suggestion of imitation as "learning the language of our partner, that is responding to whatever has meaning for them" (p. 277).

Hart (2006) identifies four key functions of imitation for the deafblind person. First, imitation attracts attention and supports interpersonal togetherness and the formation of a

joint dyadic space (Rødbroe and Souriau, 1999). Hart notes the immediate confidence-building effect of recognising a means of attracting the attention of a communication partner. Second, imitation stimulates turn-taking, a key social precursor to language development, in that the repetition of a behaviour by the partner leads to a turn-taking exchange. Third, imitation provides a way in which communication partners can recognise each other; responses to repetition and rituals can be used as a key to someone's identity. Hart's fourth function of imitation involves the recognition of a like-minded other in the communication partner, essentially promoting a 'theory of mind' and an appreciation of intersubjectivity (Nadel et al., 2000; Daelman, Janssen, Larsen, Nafstad, Rødbroe, Souriau and Visser, 2004). Imitation provides a shared point of reference (Caldwell, 2006). In short, imitation can establish or cement a relationship by providing a means of connection and prompt recognition of a behaviour's potential for meaning and its capacity to become referential. What may start out as a shared moment might form the basis for language.

Imitative sequences may utilise repetitive behaviours of a type sometimes thought to be unconstructive. Repetitive and disturbed behaviours similar to those sometimes associated with autism are observed in those who are deafblind and may arise from sensory deprivation (van Dijk, 1982; Breathnach, 1995). There is a danger that any repetitive behaviour might be perceived as maladaptive or stereotyped, when in fact some such behaviours may be utilised in, or indeed may be attempts at, communication. Some may be functionally equivalent behaviours, that is, behaviours which differ in form from conventional behaviours but which serve similar functions. The potential of such behaviours is recognised in some contemporary strategies for the development of communication skills in deafblind children (McInnes and Treffrey, 1982; van Dijk, 1986; Nafstad and Rødbroe, 1999; Janssen, Riksen-Walraven and van Dijk, 2003). In differentiating a functionally equivalent behaviour from a stereotypy, the form of the behaviour, the frequency with which it occurs, and the outcomes associated with its production should be considered (Murdoch, 1997; Murdoch, 2000). Judgements of stereotypy are often based on the form of a behaviour and the perception of the person who is performing it. Observers may fail to consider the functions served for the person who is deafblind, as his or her perception of the behaviour and its impact on the environment may differ substantially from the perception of observers. In order for the *communicative* function of a behaviour to be appreciated by the deafblind person, the communication partner must be able to recognise that the behaviour could be communicative (Murdoch, 1997), as the following case study illustrates.

CASE STUDY: IMITATION OF A PERSEVERATIVE ROUTINE

Background

Amy[1] was twelve years of age at the start of the research study, which charted her development over the course of a year. She was adopted by an Irish family at the age of

[1] Student name used in this article has been changed.

seven years having spent her early years in an overseas orphanage, where it is likely that she was deprived of stimulation. As a result of her premature birth, Amy has combined vision and hearing loss. The vision loss is near complete, but some residual hearing allows Amy to use hearing aids to hear some speech sounds. Amy can carry out some functional skills with assistance. She attends a special school for children with moderate to severe physical and learning disabilities. Amy uses a combination of various types of sign systems, including some Irish Sign Language (ISL), LAMH, deafblind manual, adaptive signs, and natural gestures. Amy has approximately twenty-five signs in her vocabulary. She uses a weekly schedule calendar system at school with a combination of miniature objects, parts of objects, cut-out representations, alphabet letters and Moon alphabet letters.

Amy's Signing Routine

Several years ago, Amy's parents and teachers noted her use of a short routine-like sequence of signs, which appeared not to be relevant to the current context. The sequence was initially topographically invariant (performed in the same way each time) and translated to: TEA-BISCUIT-TEA-BREAD-SWIMMING-OK; the signs were LAMH or ISL with some adaptation. At one stage Amy produced this sequence thirty to forty times a day, across a range of contexts, at school and at home. The possible value and functions of this routine were often discussed by her parents and teachers. Amy's mother and a teacher began to imitate the sign sequence by repeating the signs (verbally) as Amy produced them (Amy's residual hearing allowed her to hear a verbal response to a sign). As use of this perseverative routine progressed, Amy began to utilise verbal feedback from the communication partner, waiting for someone to say the sign before she continued. In this way, the communication partner imitated verbally what Amy had signed. The development of this sign routine was documented over the course of a year.

Methodology

Over a period of one year, we made eleven visits to Amy's home and school, each visit lasting one to two days. On each day, several hours of video recording documented Amy participating in a range of activities at home and at school, and interacting with her parents, teachers and a special needs assistant (SNA). Activities at school were structured and included a cooking class and art project. Activities at home were informal and mainly involved interactions with her mother. Approximately 200 pieces of video footage were collected over the study period. A description of each video clip was documented and those containing some type of communicative exchange (e.g. use of gesture, sign language, or tangible objects of reference) were transcribed for coding.

Relatively few clips were available for coding, as communicative behaviours were relatively few, a common problem when conducting research with deafblind children. Vervloed, van Dijk, Knoors and van Dijk (2006), examining interactions between a congenitally deafblind child and his teacher, found that just two per cent of recorded activities contained communicative behaviours that could be coded, despite selecting (as we did here) activities that were likely to lead to communicative interactions (e.g. playing

and dressing). Forty-one clips containing communicative behaviour were transcribed. Ten of these contained spontaneous use of the repetitive routine. These ten clips were recorded between January and September of 2007. On some visits the routine was not observed or recorded, but its use was reported by the child's teachers or parents until September, when use of the routine decreased. Two experienced teachers for the deafblind coded a range of behaviours in the video clips (including the routine) and assessed the transcriptions for accuracy. Inter-rater agreement was high, at ninety-nine per cent on the overall content of the clips (communicative/not) and ninety-one per cent agreement on the types of behaviours presented.

FINDINGS AND DISCUSSION

Of the ten clips containing the routine, seven were recorded at home (with her mother) and three at school (two involved a teacher and one involved an SNA). The number of signs exhibited increased over the ten clips, from six signs in the core sequence initially (Clip 1) to thirty-seven signs by Clip 6 (Table 1). These longer sequences do not involve thirty-seven distinct signs, rather there is repetition of segments with some new vocabulary added to the core routine. The basic or core routine consisted of five signs in a fixed sequence of six items (TEA-BISCUIT-TEA-BREAD-SWIMMING-OK). The starting core sequence of six signs grew to include eleven new signs, which were incorporated into Amy's familiar sign routine. The repetitive routine therefore appeared to provide opportunities for Amy to practise using her sign vocabulary and it increased opportunities for new signs to be introduced.

Table 1: Signs exhibited across the one year period of the study

Clip	Month	Location	Number of signs in sequence	Signs used
1	January	Home	6	Core
2	January	Home	6	Core, CS
3	January	Home	7	Core, CR +
4	January	Home	9	Core, NV
5	February	School	5	CR-
6	February	School	37	Core, CS, CR+, NV, ST
7	April	School	24	Core, NV
8	April	Home	11	Core, CR+, NV, ST
9	May	Home	31	Core, CR+, NV, ST

10	September	Home	37	Core, CR+, NV, ST

Key: Core – the core 5 sign, 6 item sequence of the routine,
CS- continues signing core sign (counted once only), CR+-repeats a core sign,
CR- core minus one of the signs, NV-new sign, ST-uses sentences

The eleven new signs that were introduced and made their way into Amy's routine are LAMH or ISL signs (MILK, SLEEP, CHEST, NOSE, MUMMY, DADDY, I , SHOWER, COFFEE, LOVE) and one adapted sign (CHANGE-CLOTHES). Three word sentences within the routine suggested a developing grammar within Amy's signing. As occurs in early development of two-word utterances (Braine, 1963, cited in Harris and Coltheart, 1986), Amy's sentences contained a pivot-open type grammar embedded within the sign routine. For example, she used the phrase "I love" (pivot) followed by one of a number of (open) nouns (all the things she loves, for instance; MUMMY, DADDY, TEA, SWIMMING). In Clips 8 to 10, signs embedded in repetitions of the core routine include: I LOVE MUMMY; I LOVE DADDY; I LOVE TEA; I LOVE SWIMMING; MUMMY-AMY-SWIMMING; DADDY-AMY-SWIMMING.

For Amy, the repetitive sign routine prompted interactions based on imitation. Particularly when using the routine with her mother, Amy seemed to be using it as a ritual to introduce an imitative interaction. She began to sign the sequence until she got her mother's attention and she waited on her mother's imitative response to each sign before continuing with the sequence. In one clip, her mother mistranslated one of the signs. Amy re-signed it until her mother said it correctly, and it was only when she had that response that she continued with her routine. This repetition of the sign until it is understood would seem to provide evidence of intentionality (Bruce, 2005), as well as flexibility to adjust responses within the routine. Amy wants to be understood, even if, at this stage, the sequence of signs is not in and of itself particularly meaningful. The rapport and the responsiveness of her communication partner are salient to her. Amy's mother shows sensitivity to Amy's behaviour, and she produces an appropriately timed, contingent and predictable response, key factors in successful interactions identified by Siegel-Causey and colleagues (Siegel-Causey and Guess, 1989) in research on interactions between mothers and their deafblind children. OR interactions identified in research on interactions between mothers and their deafblind children (Siegel-Causey and Guess, 1989).

While the sign sequence may initially have appeared to be little more than a reflexive act or stereotype, over time it acquired a function. The repetitive routine provided opportunities for advancement to more symbolic communication by assisting the production of two to three word sentences. It may also serve as a device for the development of pragmatic or social skills, helping to cultivate and maintain ongoing conversation, to stimulate turn-taking, and so forth (Bruce, 2005; Hart, 2006). The use of the routine would seem to have fulfilled three functions of repetitive behaviours as

identified by Murdoch (1997) by exercising the child's skills and interests, fine-tuning the behaviour through feedback from the adult and providing a shared social experience.

CONCLUSION

Although the reported case is atypical in that Amy has residual hearing and can benefit from verbal feedback, the heterogeneity among individuals with deafblindness suggests the findings might have wider application. Imitation rituals may be usefully employed in communication strategies for deafblind children and are not necessarily maladaptive stereotypes as sometimes suggested. Imitation of extant behaviours or routines can be useful to initiate a communicative exchange and may lead to, or further, development of language. In this case, encouragement of an apparently stereotypic routine aided fluency, providing an opportunity to practise vocabulary and grammar. If this inclination towards repetitive sequences can be harnessed in a productive way, it has the potential to facilitate meaningful interactions. However, there is also a need to identify unconstructive repetitive behaviours, as without the introduction of novel responses, such routines will not provide a connection with others or promote an interest in 'otherness' (Caldwell, 2006).

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