Prelinguistic Interventions

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Abstract

Purpose of Review: To review studies evaluating interventions for developing the prelinguistic communication skills of young children with developmental disorders and complex communication conditions.

Recent Findings: Evidence supports the use of naturalistic behavioral interventions for improving the prelinguistic communication skills of young children with developmental disorders provided that the interventions are implemented in relatively high doses.

Summary: Early intervention to replace or enhance a child's prelinguistic behaviors may help to prevent communicative breakdowns and the emergence of problematic forms of communication. Future research using rigorous methodology is needed to identify the specific intervention components that promote prelinguistic behavior change as this may lead to differential responsivity to interventions.

Keywords Prelinguistic communication, prelinguistic intervention, developmental disorders, severe communication impairment

Introduction

Within the first year of life, typically developing infants begin to communicate using non-verbal or prelinguistic behaviors. That is, long before they learn to use words or signs, typically developing infants will interact with their caregivers through the use of facial expressions (e.g., eye gaze, smiling), vocalization (e.g., crying, cooing and babbling) and/or via the use of naturalistic gestures, such as pointing and touching [1]. These prelinguistic behaviors appear to serve a number of important developmental functions. Specifically, they appear to enable infants to (a) convey their affective experiences, (b) establish and maintain social interactions, and (c) express wants and needs. With development, prelinguistic communication forms become more varied and complex. Infants show an increase in the rate of their communication and appear to communicate for more reasons. They also appear to learn to co-ordinate their gestures with sounds during communicative acts.

However, according to Romski, Sevcik, Hyatt and Cheslock not all behavior is intentionally communicative, and not all intentionally communicative behavior is effective [2]. While most children learn to communicate without formal teaching, children with complex communication conditions (CCC) (e.g., autism, cerebral palsy, and Down syndrome) are often delayed in the use of first words and they may need intervention to learn how to communicate. Due to the fact that prelinguistic communication is seen as a foundation for spoken word production, helping children to develop their prelinguistic communication may facilitate acquisition of spoken language.

Prelinguistic intervention can be defined as the use of focused, intensive stimulation activities that are designed to enhance the child's ability to communicate effectively using prelinguistic behaviors and more generally enhance the child's level of performance in communication [3]. Because of the early age at which groundwork is being laid for the development of communicative function, it would seem logical that prelinguistic intervention

should begin early for children who are at-risk for delayed speech/language development as a result of having a CCC. As part of the early intervention process, parents and carers may be able to learn to interpret their child's prelinguistic communicative signals, and thereby be in a better position to respond to these signals consistently, which may in turn enhance the further development of the child's communication skills. However, there has been little research conducted on the very early communication development of children with CCC [4].

One of the major reasons for the lack of research about the early development of children, as well as the effectiveness of intervention approaches, has been that there is a wide variety of types of CCC. This variety has made the formation of similar groups of individuals with CCC difficult for the purpose of conducting studies involving well matched experimental and control groups. Another possible reason has been the traditional emphasis on oral speech as the only acceptable form of expressive language. A third reason is the previously limited information about the typical development of prelinguistic communication skills. Nonetheless, according to Lang, Hancock and Singh, advancements over the past 50 years have changed these factors [5].

First, use of single subject design studies offer an alternative to the need for carefully matched experimental and control groups [6-8]. Second, alternative and augmentative communication systems are gaining recognition as effective and acceptable communication systems [9]. Finally, a strong body of research and literature now exists about typical developmental patterns of prelinguistic communication skills during the first year of life [10-12].

Research into typical child development offers a theoretical basis for understanding the developmental challenges that might confront a child with a CCC [13]. This research also suggests possible reasons for delays in the child with a CCC. The first 10 months in an infant's life are crucial in early communication development as the infant's early

communication experience, including parent-infant interaction is considered to provide the foundation for later communication development.[14]. During this period, the infant's early signals are motor based in terms of eye movement, hand movement, facial expression, and arm movement. If those signals are not clear, the parent may perhaps be less likely to recognize them as forms of communication, and the parent-infant interaction might, therefore, be negatively impacted [15].

The potential value of early prelinguistic intervention argues for a coming together of disciplines, through co-treatment sessions. The occupational or physiotherapist provides the stability in positioning and the normal movement experienced transitioning from position to position, whereas the speech pathologist and the classroom teacher facilitate the interaction with toys and people while also focusing on communication. As part of the early intervention team, the child's parents contribute their intimate knowledge of their child's communicative behavior and preference for certain toys [16, 17].

With this approach, the infant is perhaps better enabled to bring all of their potential to the experience at hand, be it successful play with toys, interactions with people, or simply experience with their body a more typically characteristic situation. Moreover, the child's potential to achieve their communicative behavior might be further enhanced through the use of the handling and interplay of different therapy disciplines within the safety and familiarity of the child's home environment.

If the ultimate goal for non-verbal children is the development of communicative competence and independence, then early intervention is a necessity to facilitate the child's development of communication and social skills. To be truly effective, such early intervention must address the interaction strategies of all of the child's communication partners not only the professionals. Consequently, parents and caregivers should be encouraged to attend to the informational aspects of communication intervention as well as

the structural aspect. Through guiding the parent to be the interventionist (rather than a hands-on approach by a speech pathologist or a special education teacher), parents will be encouraged to develop realistic expectations for their non-speaking children and to gradually yield responsibility for the communication interaction to the children. A recent study by Rowe and Leech addressed how the growth mindset can promote children's early gesture and vocabulary development [18].

Rowe and Leech reported on the findings of an 8-month parent intervention program that had an embedded growth-mindset component aimed at increasing parents' use of pointing gestures and, in turn, their toddlers' use of pointing and expanding the child's vocabulary [18]. A second objective was to explore the effects of the intervention on parents from different socio-economic status backgrounds and with different mindsets about intelligence. Parents in the intervention group completed a brief training program which involved a 5-min video and encouragement to play with their child for 15-min every day. Parents also received weekly reminders to use pointing gestures during play sessions.

Video-recordings of parent-child play interactions were collected from all parents (n = 47) at their homes, when the children were aged 12, 14 to 16 and 18-months. The analysis of the transcribed verbal and non-verbal communication in parent-child play interactions revealed significant improvements for parents and their children in the intervention group. Significant increases were noted in parental use of pointing and use of vocabulary with reference to objects compared to parents in the control group. A significant improvement was observed in the pointing vocabulary of children interacting with parents who endorsed a growth mindset.

A noteworthy finding of this study was that children whose parents endorsed fixed growth mindsets at baseline made significant and faster progress in pointing, had faster vocabulary growth at 10-months and greater expressive vocabulary at 18-months compared

to the children whose parents endorsed fixed mindsets. This finding reflects the potential of embedding a growth mindset component in parent-toddler interventions, especially with parents upholding fixed ideas about their children's intelligence.

In another recent study, Reith et al., adapted a parent coaching naturalistic behavioral intervention for speech therapists to use with toddlers and their families [19]. This training model alternated brief didactic information sessions and hands-on practice with feedback. The process was repeated six times for a total of 12 sessions (six didactic and six coaching). Following the initial 12-week training, this model recommended an additional 3-month period of practice of the strategies and bi-monthly therapist coaching from a supervisor to provide continued support and skill development of the therapists in using reflective practice to support early intervention.

This extended training time provided an opportunity for the trainer to observe the therapist implementing the strategies over time as confidence and skills develop. The intervention commenced with the parents observing the therapist providing intervention only and progressed to full parent implementation of the techniques with didactic explanations and explicit coaching from the interventionist. Initial data demonstrated a promising influence on the therapist's ability to promote the use of parent coaching in community early intervention programs.

Lessons learned from the implementation process included the importance of therapist background knowledge, the complexity of working with parents of young children, and needed supports for those working closely with parents, including specific engagement strategies and the incorporation of reflective practice [19]. However, perhaps due to the clinical expertise and training required, these approaches are not widely used in community settings.

A third parent training and clinician-delivered in-home communication intervention was conducted by Gengoux, Abrams, Schuck, et al., [20]. Here a randomized controlled trial was conducted to evaluate a pivotal response treatment package (PRT-P). Children aged between 2 and 5 years with Autism Spectrum Disorder and a significant language delay were randomly assigned to either the PRT-P or a delayed treatment group (DTG) for 24 weeks. Pivotal response treatment (PRT) is a naturalistic developmental behavioral intervention designed to increase a child's motivation to interact by focusing on the child's interests and rewarding effort with natural reinforcement [21]. For example, an interventionist might model appropriate language during snack time and wait for the child to attempt communication before providing access to the preferred food item.

In this study, the PRT-P consisted of parent training and clinician-delivered in-home intervention targeting functional communication deficits in the children. The PRT-P treatment consisted of an intensive phase from week 1 to week 12, during which parents received weekly 60-minute training sessions and children received 10 hours per week of clinician-delivered in-home treatment. They also engaged in a maintenance phase from week 12 to week 24 during which parents received monthly 60-minute parent training sessions and children received 5 hours per week of in-home treatment [21]. The parent training curriculum was based on a standard set of PRT teaching materials and video examples [22].

Meanwhile, the children who had been assigned to the DTG continued with stable community treatments for the 24 weeks trial and returned to the clinic at weeks 12 and 24 for assessments. After the completion of all study measures, these families were offered PRT parent training and in-home treatment similar to the PRT-P group. The effect of treatment on child communication skills was assessed via behavioural coding of parent-child interactions, standardized parent report measures and blinded clinician ratings [20].

Children participating in the PRT-P group showed significantly greater overall improvement between baseline and week 24 in total number of utterances. While no parent met fidelity of PRT implementation at baseline, at week 24, 91% of parents in the PRT-P group met fidelity of PRT implementation. Lessons learned from this study supports the efficacy of combining parent training with clinician delivered in-home treatment for improving functional communication skills of young, minimally verbal children.

Practice Recommendations

Based on this brief review, a number of practice recommendations can be suggested. First, efforts to enhance children's prelinguistic communication skills could be seen as a viable objective for early intervention programs for young children with developmental disorders and communication impairment. This priority would seem warranted for at least two reasons. First, it is an area of critical need in that most children with communication impairment have limited speech and language abilities [23]. Second, without explicit intervention, such children are unlikely to acquire other formal modes of communication that could serve as alternatives to speech [2]. Limited communication skills can restrict the child's ability to express their wants and needs and participate in meaningful social interactions with others. Early intervention services are often provided in the home, and this means there is a need for empirically validated strategies for supporting parents in the design and implementation of communication interventions for their children.

Historically, early intervention programs to develop communication skills have been based on a developmental-functional approach [24, 25]. This approach is consistent with evidence showing that prior to speech, typically developing children acquire various informal behaviours that serve a communicative function. This "prelinguistic repertoire" may consist of informal or natural gestures, facial expressions, body movements, eye gaze, and

vocalizations [26]. In the absence of speech or augmentative and alternative communication, children with a communication impairment may continue to rely on prelinguistic behaviours to communicate [27]. Continued and exclusive reliance on prelinguistic behaviour can be problematic. For example, when the topography of the prelinguistic behaviour is difficult to interpret or is socially unacceptable (e.g., aggression, self-injury, tantrums). In other cases, however, the child's prelinguistic behaviours might be viewed as acceptable and legitimate forms of communication (e.g., facial expressions, eye gaze, reaching).

While perhaps socially acceptable, these types of prelinguistic behaviors may nonetheless be limiting. For example, it is difficult to communicate about absent objects and past events and to communicate precisely with prelinguistic behaviors. In addition, the prelinguistic behaviors of children with developmental disabilities are often highly subtle and idiosyncratic [28], which could make it difficult for listeners to recognize and interpret the child's communicative attempts. This could lead to frequent communicative breakdowns, which could in turn provoke an escalation to problem behaviour in an attempt to repair the communicative breakdown [29]. There may thus be value in replacing or enhancing the child's existing prelinguistic behaviors by teaching alternative and more advanced or precise forms of communication that would serve the same function as the child's existing prelinguistic behaviors.

Summary and Conclusion

Parent-focused interventions are the core of many recent initiatives that seek to promote communication success in young children who are at risk or have an identified prelinguistic communication impairment [30]. In this paper authors reviewed three recent studies which highlighted a naturalistic developmental perspective involving parent-focused language interventions supported by clinicians and researchers. Each of these naturalistic developmental behavioral interventions included an explicit focus on coaching parents to use

therapy techniques in daily routines. Clinicians are advised to select interventions using an evidence-base practice framework [31]. This form of prelinguistic intervention is considered by many to be best practice for young children with communication impairments [32].

Naturalistic interventions are considered effective in teaching core communication skills to children [33] because they align with the principles of developmentally appropriate practices for young children. Compared with highly structured, adult-directed interventions; naturalistic interventions incorporating behavioral learning principles may be more appropriate for teaching prelinguistic communication to very young children who develop skills within the context of social relationships, meaningful routine and play activities [34].

In naturalistic interventions, skills are taught using child preferred items and activities that may increase child engagement and therefore motivation to communicate. These interventions share components including embedding instruction within natural environments, following the child's lead, strategic use and fading of prompts, and providing natural consequences [35]. Furthermore, evidence exists for the generalization and maintenance of these skills following intervention [32]. Nonetheless, in some of the prelinguistic intervention literature available, it is difficult to determine what components produced effects for whom and for what behaviours. Consequently, additional research is needed to understand the optimal combination of treatment providers and intensity as well as to identify which children and parents are most likely to benefit from prelinguistic intervention programs.

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