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**Title:** Assessing Parent-Child Interaction in Infant Deafness.

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## **Structured Abstract:**

Purpose of Review: To highlight the importance of parent-child interaction (PCI) in infant deafness and address the lack of robust assessment tools in clinical practice.

### Recent findings:

Most deaf babies are born to hearing parents with little experience in deafness. Deafness can reduce access to spoken language. Despite advancements in amplification technology, deaf children still present with delays in attention and communication skills at the start of nursery. Research reports that hearing parents of deaf infants can be more directive during interaction, spend less time following the child's focus of attention, and have more difficulty achieving successful turn-taking in conversation. Much research tells us that these factors impact on the quality and quantity of PCI. Good PCI, in all infants, but especially so in deafness, is a strong predictor of child language outcomes. Teachers of the Deaf and Speech and Language Therapists are the first professionals to support families in the home. For these professionals, having an objective way of assessing PCI would greatly assist and standardise their practice. However, to date, there are no deaf-specific assessments to observe and appraise a parent's communication behaviours when interacting with their deaf child.

### Summary:

Intervention studies with families of deaf children have shown success in improving parental sensitivity and facilitative language techniques. An observational assessment in parent-deaf child interaction would ensure that communication interventions are appropriately targeted on the individual family's needs.

Keywords: deaf, parent-child interaction, assessment, speech and language therapy, early years.

## **Text of review:**

### Introduction:

The focus of this review article is to discuss parent-child interaction in deafness and the absence of tools available for professionals to use when supporting parents and caregivers with their newly diagnosed deaf infants. The paper will begin with defining the terms ‘deafness’ and ‘parent-child interaction’. We will then review how deafness can impact the interactions between a caregiver and their child, with particular focus on consequences for communication development. The paper will then identify parental skills that are correlated with child language and conclude with a rationale for why a robust assessment tool to assist professionals in appraising parent-child interaction in practice is important.

### The term ‘deafness’

In this paper, we use the term ‘deaf’ to refer to the entire spectrum of deafness in childhood, from mild to profound. We follow the recommendation from the British Association of Teachers of the Deaf in 2020 [1] to use the terms ‘deafness’ and ‘deaf’ rather than ‘hearing loss’ and ‘hearing impairment’.

### Parent-child interaction

Parent-child interaction focuses on the reciprocal, face-to-face, dyadic relationship between caregiver and child. Good interaction involves the parent (or caregiver) giving appropriate,

responsive, and effective language input to facilitate positive social-emotional development and communication skills within the child [2].

Parents who are sensitive or receptive to their child's needs will provide prompt, contingent responses to their child's communicative behaviour [3]. Responses include language (words, signs, repetitions, questions and modelling of sentences) as well as additional communicative behaviours (facial expressions, gesture, touch, and tone). Much research suggests it is the quality, frequency, consistency, and accessibility of a parent's communication that predicts a child's communicative development [4,5,6].

### The impact of deafness

The most recent figures indicate that there are over 50,000 deaf children in the UK [7]. Since the start of New-born Hearing Screening throughout the UK in 2006, deaf children are now identified earlier than previously and provided with hearing aids and/or cochlear implants. Despite these advances, many deaf children start nursery with delayed language skills, including difficulties with joint attention and engagement [8, 9, 10, 11]. A major cause of delay is that even with optimal amplification, deaf children are unable to access as much spoken language as hearing children, and miss out on opportunities to pick up on information via incidental learning [12]. Moreover, 90% of deaf children are born to hearing parents who have little experience of deafness, no signing skills, and use spoken language as the communication mode. Therefore, families need to rapidly develop knowledge and skills in how best to communicate with their deaf children.

### Why is interaction important

Many studies have found the quantity and quality of parental involvement and interaction is the greatest predictor of deaf children's developmental outcomes [13\*, 14, 15, 16, 17]. Parents who have not yet developed skills in communicating with their deaf children are likely to provide reduced language input which in turn affects how a child develops their own understanding and use of language [18].

Studies have reported that often hearing parents of deaf children tend to be more likely to lead or direct the attention of infants in their interactions, compared to deaf parents of deaf children and hearing parents of hearing children [19, 20]. They can often struggle with using appropriate visual cues for the infant to attend to language and can be less sensitive to timing as deaf infants need to visually scan the environment for meaning [21, 22]. Hearing parents can spend less time in co-ordinated joint attention with their deaf children [23, 24] and are more likely to interrupt their children's attention by initiating new, unrelated activities [25]. Hearing parents have also been shown to elicit language from their deaf children through requests rather than in conversations, meaning deaf children have less experience of two-way interaction and receive less feedback on their communicative attempts [11].

If not addressed and supported early, reduced quality of parent-child interaction and access to language can lead to long-term difficulties in communication and cognition [26\*, 12]. Reduced interaction can also lead to feelings of loneliness, frustration and low self-esteem in deaf children and young people [27, 28].

#### Parent skills that relate to improved child language:

This section will refer to 'parent sensitivity'. This concept refers to the attunement of a parent to their child's attempts to communicate and encapsulates the responsiveness of the parent to

the child's needs and goals [29]. Sensitivity is not just focused on one member in isolation but within an interactive context; it refers to how a parent reads and responds to their child's signals (both signals of distress and more positive signals of intrigue and pleasure within the interaction) [30].

Parental sensitivity and non-intrusiveness (following the child's lead) were correlated with more words produced by deaf children [31]. Pressman and colleagues [17] found the same correlations; mothers with higher scores in sensitivity had deaf children with higher language scores in their follow up assessments. Through regression analyses, Pressman and team found that parental sensitivity positively predicted follow-up language scores and accounted for 10% of the variance [17].

Further evidence of the importance of sensitivity in interaction was highlighted by Quittner and team [32]; even after controlling for family demographics and child amplification experience, maternal sensitivity and cognitive stimulation by the parent predicted increases in deaf children's language growth. Using measures of maternal sensitivity and language stimulation skills, they found parents with above mean scores had children who showed 1.5 years less delay in language, than parents with lower ratings of the same skills [32].

Parental sensitivity is not the *only* important factor in interaction. Dirks and Rieffe [24] compared the interactions between parents of children with moderate hearing loss and parents of children with normal hearing. The authors found differences in child language and in the time spent jointly attending in play, (parents did not differ in ratings of parent sensitivity). Dirks and Rieffe found time spent in joint attention was also positively related to child language [24].

This suggests that monitoring skills in how parents gain and maintain their child's attention is another important area for professionals to assess and support.

With strong correlations between good parent-child interaction and child language, it is clearly important professionals monitor and support parent's abilities to attend and appropriately respond to child-led, child-initiated communication.

#### The assessment of parent-deaf child interaction in deafness

To date, there is no clinical assessment tool that evaluates a parent's interaction skills when they are communicating with their deaf child. Measures such as the Ski-Hi Language Development Scale [33] track the deaf baby's expressive and receptive language development but do not measure the quality or quantity of parent input. Tools used to assess parent interaction in research are often experimental in nature (i.e. designed for in-depth coding of videos made for research projects) and not appropriate for professionals to assess behaviours in the family home. Additionally, whilst practitioners use interventions aimed at improving parent-deaf child interaction e.g., Hanen, the assessment stage is not standardised.

NICE guidelines on assessment or therapeutic interventions that support deafness in childhood do not exist. The Royal College of Speech and Language Therapists (RCSLT) do not provide any specific information relating to assessments or interventions for SLTs to use when working with deaf babies and their families. Whilst the British Association of Teachers of the Deaf (BATOD) and RCSLT's position paper [34] list many language and speech assessments, none relate to parent-child interaction.

The absence of a reliable, evidence-based assessment tool means that professionals may lack agreement on which skills are important to appraise in the home. It also raises the chances that there is disparity between professionals on how to identify strengths, needs and targets for intervention, which could impinge on the child's development if therapy goals are not appropriate.

Many intervention studies in deafness have shown us that it is possible to educate and train parents of deaf children on how to improve their responsiveness [35], sensitivity, language use and shared attention [13\*], and overall communicative support strategies [36\*]. We also know that higher ratings of self-efficacy in parents of deaf children are positively correlated to higher quality facilitative techniques [16]. Intervention, coaching, and support is crucial, but it is more effective when it is targeted, individualised and family-focused [37]. An assessment tool for practitioners will ensure therapy approaches are directed at areas of identified need.

#### Future research:

The authors are currently preparing a systematic review of which parent-child interaction behaviours are most often included in the research of deaf infants, and how these behaviours are assessed [38]. Following this, a national survey will ask the same questions of practitioners to investigate whether the systematic review findings are reflected in current clinical practice.

#### Conclusions:

This paper has defined and reviewed parent-child interaction within the context of infant deafness. Deafness can reduce access to spoken language and many studies report hearing parents are less sensitive in their use of interaction strategies. The review also highlighted the relationship between good parent-child interaction and deaf children's language skills. Parent-

focused interventions have been shown to improve parent-child interactions, but in order to know which skills to focus on explicitly, a thorough assessment of strengths and needs is required. In conclusion, there is a need for an evidence-based, observational tool specific to deafness to assist professionals with standardising the assessment, appraisal and monitoring of parent-child communication.

### **Key points:**

1. Despite advancements in amplification technology, deaf children present with delays in attention and communication skills.
2. Research shows that the quality and quantity of parent-child interaction in deafness is a strong predictor of child language outcomes.
3. Teachers of the Deaf and Speech and Language Therapists require an evidence-based observational tool to assess and monitor parent-deaf child interaction.
4. A psychometrically robust clinical assessment of parent-deaf child interaction would ensure that communication interventions are appropriately targeted on the individual communication needs of each family.

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## **Conflicts of interest:**

The authors declare there are no conflicts of interest.

## **References**

1. British Association of Teachers of the Deaf (BATOD). 'Use of Terminology' [Internet]. BATOD. 2020 [cited 15<sup>th</sup> January 2021]. Available from: <https://www.batod.org.uk/use-of-terminology/>
2. Abu Bakar, Z., Brown, P. M., & Remine, M. D. (2010). Sensitivity in interactions between hearing mothers and their toddlers with hearing loss: The effect of cochlear implantation. *Deafness & Education International*, 12(1), pp 2-15.  
doi:10.1179/146431510X12626982043525
3. Bornstein, M.H. & Tamis-LeMonda, C.S. (1989). Maternal responsiveness and cognitive development in children. *New Directions for Child and Adolescent Development*, 1989, 43: pp. 49-61.
4. Baumwell, L., Tamis-LeMonda, C. S., & Bornstein, M. H. (1997). Maternal verbal sensitivity and child language comprehension. *Infant Behavior and Development*, 20(2), pp. 247-258.
5. Koester, L.S. & Lahti-Harper, E. (2010). Mother–Infant Hearing Status and Intuitive Parenting Behaviors During the First 18 Months. *American Annals of the Deaf*, 155(1), pp 5–18.
6. Tamis-LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal Responsiveness and Children's Achievement of Language Milestones. *Child Development*, 72, pp 748–67.
7. Consortium for Research into Deaf Education (CRIDE). 'CRIDE report on 2018/19 survey on educational provision for deaf children in England'. [Internet]. National

Deaf Children's Society. 2019 [cited 15<sup>th</sup> January 2021]. Available from:

<https://www.ndcs.org.uk/media/6547/cride-2019-england-report-final.pdf>

8. Hoffman, M.F., Cejas, I., & Quittner, A. L., & The Childhood Development after Cochlear Implantation (CdaCI) Investigative Team. (2016). Comparisons of longitudinal trajectories of social competence: Parent ratings of children with cochlear implants versus hearing peers. *Otology & Neurotology*, 37(2), pp 152–159.
9. Geers, A. E., Moog, J. S., Biedenstein, J., Brenner, C., & Hayes, H. (2009). Spoken language scores of children using cochlear implants compared to hearing age-mates at school entry. *The Journal of Deaf Studies and Deaf Education*, 14 (3), pp 371-385.
10. Caselli, M. C., Rinaldi, P., Stefanini, S., & Volterra, V. (2012). Early action and gesture “vocabulary” and its relation with word comprehension and production. *Child development*, 83 (2), pp 526-542.
11. Rinaldi, P., Baruffaldi, F., Burdo, S., & Caselli, M. C. (2013). Linguistic and pragmatic skills in toddlers with cochlear implant. *International Journal of Language & Communication Disorders*, 48, pp 715–725.
12. Morgan, G. (2015). ‘Social-cognition for learning as a deaf student’. In: Knoors, H. and Marschark, M. (Eds) *Educating Deaf Learners: Creating a Global Evidence Base*. Oxford: Oxford University Press.
13. \*Nicastri, M., Giallini, I., Ruoppolo, G., Prosperini, L., de Vincentiis, M., Lauriello, M., Rea, M, Traisci, G. and Mancini, P. (2020). Parent Training and Communication Empowerment of Children With Cochlear Implant. *Journal of Early Intervention*, 1-18.

This pre-post, matched control intervention study improved both parental communication strategies and deaf children's spoken language using a program based on the Hanen model ‘It Takes Two to Talk’.

14. Ambrose, S.E., VanDam, M., & Moeller, M.P. (2013). Linguistic input, electronic media, and communication outcomes of toddlers with hearing loss. *Ear & Hearing*, 35, pp 139–147.
15. DesJardin J. L. (2003). Assessing parental perceptions of self-efficacy and involvement in families of young children with hearing loss. *Volta Review*, 103, pp 391–409.
16. Yoshinaga-Itano, C. (2003). From screening to early identification and intervention: Discovering predictors to successful outcomes for children with significant hearing loss. *Journal of Deaf Studies and Deaf Education*, 8, pp 11–30.
17. Pressman, L., Pipp-Siegel, S., Yoshinaga-Itano, C., & Deas, A. (1999). Maternal sensitivity predicts language gain in preschool children who are deaf and hard of hearing. *Journal of Deaf Studies and Deaf Education*, 4(4), pp 294–304.
18. Levine, D., Strother-Garcia, K., Golinkoff, R.M., & Hirsh-Pasek, K. (2016). Language Development in the First Year of Life: What Deaf Children Might Be Missing Before Cochlear Implantation. *Otology & Neurotology*, 37 (2), pp 56-62.
19. Barker, D.H., Quittner, A.L., Fink N., Eisenberg, L., Tobey, E., Niparko, J., & the CDaCI Investigative Team. (2009). Predicting behavior problems in deaf and hearing children: The influences of language and attention. *Development and Psychopathology*, 21, pp 373–392.
20. Vaccari, C. and Marschark, M. (1997). Communication between parents and deaf children: implications for social-emotional development. *J Child Psychol Psychiatry*, 38(7), pp 793-801. 2
21. Spencer, P.E. (2000). Looking Without Listening: Is Audition a Prerequisite for Normal Development of Visual Attention During Infancy?, *The Journal of Deaf Studies and Deaf Education*, 5 (4), pp 291- 302.

22. Quittner, A. L., Barker, D. H., Cruz, I., Snell, C., Grimley, M. E., Botteri, M., & the CDaCI Investigative Team (2010). Parenting Stress among Parents of Deaf and Hearing Children: Associations with Language Delays and Behavior Problems. *Parenting, science and practice*, 10(2), pp 136–155.
23. Dirks, E., & Rieffe, C. (2018). Are You There for Me? Joint Engagement and Emotional Availability in Parent–Child Interactions for Toddlers With Moderate Hearing Loss. *Ear and Hearing*, 40(1), pp 18-26.
24. Harris, M. & Chasin, J. (2005), Visual attention in deaf and hearing infants: the role of auditory cues. *Journal of Child Psychology and Psychiatry*, 46, pp 1116-1123.
25. Meadow-Orlans, K.P. & Spencer, P.E. (1996). Maternal Sensitivity and the Visual Attentiveness of Children Who Are Deaf. *Early Dev. Parent*, 5, pp 213-223.
26. \*Hall, M.L., Hall, W.C., & Caselli, N.K. (2019). Deaf children need language, not (just) speech. *First Language*, 39: 367- 395.

<https://doi.org/10.1177/0142723719834102>

This review paper refutes the claim that deaf children must learn to listen and speak to develop optimally, and instead argue that children require access to a *language* that is fully accessible (i.e., sign languages) in order to combat the risks of language deprivation and associated developmental delays.

27. National Deaf Children’s Society (NDCS). ‘Position Paper: The Emotional Wellbeing and Mental Health of Deaf Children and Young People’. [Internet]. 2017 [cited 10th Jan 2018]. Available from: <https://www.ndcs.org.uk/media/3355/emotional-well-being-and-mental-health-of-deaf-children-and-young-people.pdf>
28. Theunissen, S., Rieffe, C., Kouwenberg, M., Soede, W., Briaire, J.J., & Frijns, J.H.M. (2014). Depression in hearing-impaired children. *International Journal of Pediatric Otorhinolaryngology*, 75 (10), pp.1313- 1317.

29. Emde, R. N. (1980). Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In Taylor, P. M. (Ed.), *Parent–infant relationships*. Orlando: Grune & Stratton, pp. 87–115.
30. Biringen, Z., & Easterbrooks, M. (2012). Emotional availability: Concept, research, and window on developmental psychopathology. *Development and Psychopathology*, 24(1), 1-8. doi:10.1017/S0954579411000617.
31. Vohr, B., St Pierre, L., Topol, D., Jodoin-Krauzyk, J., Bloome, J., & Tucker, R. (2010). Association of maternal communicative behavior with child vocabulary at 18–24months for children with congenital hearing loss. *Early Human Development*, 86(4), pp 255–260.
32. Quittner, A. L., Cruz, I., Barker, D. H., et al; Childhood Development after Cochlear Implantation Investigative Team. (2013). Effects of maternal sensitivity and cognitive and linguistic stimulation on cochlear implant users’ language development over four years. *J Pediatr*, 162, 343–348.
33. Watkins, S. (2004). *Ski-Hi Language Development Scale*. Utah State University: Ski-Hi Institute. 44.
34. British Association of Teachers of the Deaf (BATOD) and Royal College of Speech and Language Therapists (RCSLT). (2019). ‘Position Paper: Collaborative Working Between Speech and Language Therapists and Teachers of the Deaf’. RCSLT. 2019 [cited 15<sup>th</sup> January 2021]. Available from: <https://www.rcslt.org/wp-content/uploads/media/docs/clinical-guidance/rcslt-batod-guidance.pdf>
35. Glanemann, R., Reichmuth, K., Matulat, P., & Zehnhoff-Dinnesen, A. A. (2013). Muenster Parental Programme empowers parents in communicating with their infant with hearing loss. *International journal of pediatric otorhinolaryngology*, 77(12), 2023-2029.

36. \*Roberts, M. Y. (2019). Parent-Implemented Communication Treatment for Infants and Toddlers With Hearing Loss: A Randomized Pilot Trial. *Journal of speech, language, and hearing research*, 62(1), pp. 143-152.

This is the first pilot randomised control trial of it's kind in deafness; they found training parents in communication support strategies benefitted their deaf child's prelinguistic skills.

37. Moeller, M.P., Carr, G., Seaver, L., Stredler-Brown, A., & Holzinger, H. (2013). Best Practices in Family-Centered Early Intervention for Children Who Are Deaf or Hard of Hearing: An International Consensus Statement, *The Journal of Deaf Studies and Deaf Education*, 18 (4), pp 429–445.

38. Curtin, M., Dirks, E., Cruice, M., Herman, R., Morgan, M. 'What are the range and frequencies of parent interaction behaviours that have been assessed in parent-child interaction research with deaf children aged 0 –5?' [Internet]. PROSPERO: International prospective register of systematic reviews. 2020 [cited 15<sup>th</sup> January 2021]. Available from: [https://www.crd.york.ac.uk/PROSPERO/display\\_record.php?RecordID=198567](https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=198567)