Cochlear implants in children: Development in interaction with the social context

Wiefferink, C.H.

Chapter 6

Discussion

General discussion

The aim of this thesis is to provide more insight into some of the aspects that affect the daily functioning of children with a CI and into environmental factors that influence their development. We have therefore focused on 1) the influence of parents on these children's daily functioning, 2) the influence of language mode on their language development, and 3) the influence of a CI on their social-emotional functioning.

The picture that emerges from this work is that the language development and social-emotional development of young children with a CI in the Netherlands lags behind that of their normally hearing peers: standardized tests (Chapter 3) and parent reports (Chapters 4 and 5) all showed that these children's receptive and expressive language skills were poorer. This is consistent with a recent study by Niparko et al. (2010), who found that gaps in spoken-language development between children with a CI and normal-hearing children were still evident three years after implantation. But while children with a CI also used less adequate emotion-regulation strategies and were less socially competent than their hearing peers, parents did not report more behavioral problems (Chapter 4). As Chapter 5 shows, development in emotion understanding was delayed in children with a CI, who were less proficient in discriminating and identifying the facial expressions that accompany the four basic emotions (happiness, sadness, anger, and fear). They were also less proficient in attributing emotions in prototypical situations.

Another finding of this thesis is that language development and social-emotional development vary widely in children with a CI. This is consistent with the literature (Spencer, 2004; Thoutenhoofd, Archbold, Gregory, Lutman, Nikolopoulos & Sach, 2005; De Raeve, 2010). In some children, language development is similar to that of normally hearing children. Some others barely acquire spoken language at all. As shown by the larger standard deviations in children with a CI, something similar applies to social-emotional development: while some children failed to participate in the tasks, others performed relatively well.

How can we explain such wide varieties in their development? According to Bronfenbrenner's social-ecological model (1979), children's

development is influenced not just by child characteristics, but also by a child's immediate and wider social environment. For children with a CI, age at implantation is known to be particularly important. On average, spoken language is better in those who receive their CI before the age of eighteen months than in those who receive it later (Niparko, Tobey, Tahl, Wang, Quittner & Fink, 2010; Chapter 3).

Intrapersonal and interpersonal factors can also be identified in this respect. This thesis has identified some factors in these children's immediate and wider social environment which not only affect their functioning, but have not to our knowledge been studied in depth before.

Parental influence on CI children's daily functioning and development

The experiences of Turkish parents of deaf children with a CI in the Netherlands showed clearly that wider social support systems are not tailored to their needs when they learn that their child is deaf (Chapter 2 of this thesis). As the values and beliefs of Turkish parents differ greatly from those of Dutch family counselors and other healthcare professionals in the Netherlands, support for Turkish families is less than optimal, and the language development of deaf Turkish children is delayed (Wiefferink, Vermeij, Van der Stege, Spaai & Uilenburg, 2008).

The effects of the differences between Turkish parents and Dutch healthcare professionals become evident soon after diagnosis, when parents have to make important decisions on hearing-rehabilitation. Many Turkish parents did not trust the diagnosis that their child is deaf, or find it difficult to accept the deafness of their child. This may delay the uptake of hearing-rehabilitation, which was confirmed in an earlier study showing that, on average, Turkish children receive a CI nearly a year later than their Dutch peers (Wiefferink, et al., 2008).

Turkish parents also experience difficulties in being actively involved in the care of their deaf child. These findings are in line with a study by Steinberg et.al. (2003), who reported that parents from minority groups in the USA found

it difficult to make decisions on the care of their deaf child, and that these difficulties might be due to cultural differences.

Influence of language mode on the language development of children with a CI

In the Netherlands, those in the immediate and wider social surroundings of children with a CI are unable to create a truly bilingual climate for them. As a result, the spoken language development of Dutch children with a CI lags behind that of their Flemish counterparts, who are raised in a monolingual environment. Moreover, as soon as these Dutch children acquire spoken language, sign language did not progress any further (Chapter 3 of this thesis). Theoretically, a bilingual environment may be the best option for deaf children with a CI, for despite their CI, these children do not have normal hearing. They still experience problems when they have to take off their CI (e.g. when swimming or at night) or when they are in a noisy classroom. Under such circumstances, sign language may help them.

In practice however, it seems infeasible to raise young children with a CI bilingually. As soon as they can communicate with their child in spoken language, hearing parents of such children are much less motivated to learn sign language, and rely more on spoken language (Archbold, Nikolopoulos, Tait, O'Donoghue, Lutman & Gregory, 2000; Nordqvist & Nelfelt, 2004; Preisler, Tvingstedt & Ahlström, 2005). Because these children are thus exposed to sign language only at preschool or school, their exposure to spoken language exceeds their exposure to sign language. Due also to a preference for spoken language in most children with a CI (Wheeler, Archbold, Gregory & Skipp, 2007), it is difficult for many of them to master sign language at a level adequate for their daily interactions.

Currently, this conflicting situation between the desired linguistic environment (bilingual) and the real linguistic environment (spoken language only) is recognized by parents, professionals working with deaf children (e.g. teachers and family counselors), and members of the deaf community. However, two different positions are taken regarding how to deal with this situation.

The first position is that, due to the changes in deaf children's environment brought by neonatal hearing screening and cochlear implants, the linguistic environment of deaf children with a CI should be reconsidered (Knoors, 2011). Knoors (2011) states that it should be accepted that most parents of deaf children with a CI choose to communicate with their child in spoken language and that professionals should facilitate this choice.

The other position is that deaf children with a CI should have a right to bilingualism. This position is usually taken by members from the deaf community and by hearing people involved in this community. At 'Sign Languages as Endangered Languages', a conference organized by the deaf community in Norway in November 2011, it was noted that the status of sign languages is under threat in Denmark and the Netherlands.

Which position is in the best interest of the deaf child with a CI? Seen from the perspective of the social-ecological model, a child's development is directly influenced by the quality and quantity of interaction between children and parents, teachers, and peers. Similarly, through these parents, teachers, and peers, it is influenced indirectly by those in the wider social environment, such as the deaf community, schools, and healthcare organizations. Regardless of ideological, philosophical or theoretical issues, this environment should help parents, teachers, and peers to optimize their interaction with these children.

To create an optimal linguistic environment for these children and their parents, healthcare professionals first have to determine what would be the best linguistic environment for each specific child, taking account of child characteristics, the parent's characteristics, and the immediate social environment. Next, they should help parents to create this optimal linguistic environment through counseling and parental training, and through educational placements that provide the child with the best possible linguistic environment.

Influence of CI on children's social-emotional development

Language skills are associated with social-emotional development: better language skills are related to better social-emotional development. This is as true for normal-hearing children as it is for those with a CI. Although the

studies on social-emotional development described in Chapters 4 and 5 are based on cross-sectional data, assumptions about causality can be formulated only on the basis of our theoretical knowledge of overall development. Statements on causality are therefore hypothetical and should be further tested in longitudinal research. The results presented in this thesis indicate that because language development in young children with a CI is delayed, their social-emotional development is also likely to be delayed. In turn, through the quality and quantity of their interactions with parents, teachers, peers, and others, their language development is probably influenced by those in their immediate social environment. As described above, it is also influenced by factors in their wider social environment.

However, the studies in Chapters 4 and 5 also revealed some noteworthy differences between children with a CI and hearing children with regard to the relationship between language and social-emotional development. In both groups, expressive and comprehensive language skills were related to verbally attributing emotions to prototypical situations and explaining why the protagonist felt that emotion. However, in prototypical situations in which children were asked to point at a drawing with the correct facial expression, the language skills of children with a CI were unrelated to emotion-attribution – unlike in normal-hearing children, in whom the two were strongly correlated. Similarly, in normal-hearing children, comprehensive language skills were related to the ability to correctly identify facial emotion expressions; in children with a CI they were not. This suggests that language helps normal-hearing children to develop their ability to recognize facially expressed emotions, but that it does not help children with a CI. It is thus possible that language is a prerequisite for properly interpreting facial emotional expressions. If so, this might explain why children with a CI unexpectedly fell behind their hearing peers in a nonverbal emotion-recognition task. These outcomes also imply that factors other than language skills are important for children's emotional development.

A crucial factor in addition to language is children's so-called emotion socialization. Emotion socialization refers to how the immediate environment affects the development of emotion understanding and emotion regulation in young children (Morris, Silk, Steinberg, Myers & Robinson 2007). Chapter 1

describes how emotion socialization in deaf children differs from that in normally hearing children – the product of less exposure to and modeling by parents, and of more problems in the interactions between parents and their deaf child. A further cause lies in the fact that the parenting styles of parents of deaf children are generally poorer than those of parents of normal-hearing children.

While less is known about emotion socialization in children with a CI, it is reasonable to assume that, in the first years of their life, before they have access to spoken language, it does not differ much from that in deaf children without a CI. As the children studied in this thesis were still very young, their social-emotional delay may have been caused by these early differences in emotion socialization.

The fact that emotion socialization develops different in children with a CI and normally hearing children, may also differently affect the social functioning of children with a CI. Social functioning refers to the ability to interact and form relationships with others (Denham, Blair, DeMulder, Levitas, Sawyer, Auerbach-Major & Queenan, 2003) and a healthy emotional development is crucial to this. This was confirmed in our study for normally hearing children. The outcomes of the study described in Chapter 4 showed that more positive emotion expression and more adequate coping strategies were strongly associated with better social competence. However, we did not find the same associations between emotional functioning and social functioning in young children with a CI. As stated in Chapter 4, this implies that social competence develops differently in children with a CI than in normally hearing children, indicating that young deaf children with a CI seem less aware of the function of emotion in social interactions as was also evident in older deaf children (Rieffe & Meerum Terwogt, 2006).

Taken together, the studies described in this thesis indicated that the emotional and social development of children with a CI differs from that of normally hearing children. Our findings indicate that CI children's social-emotional development is negatively influenced by their deafness, even when a task does not require language skills. The fact that children with a CI also fell behind their normally hearing peers on non-verbal tasks emphasizes that a social context is crucial for children's emotional development. The delay in social-emotional development in CI children might therefore be explained by poorer

language skills and lower exposure and less modeling from adults before they received their CI.

Implications for professional practice

In the view of the author, the results of these studies have implications for healthcare professional's practice; these are outlined below.

Parental influence and involvement

Seen from a social-ecological perspective, the cultural values and beliefs in the immediate environment of a deaf Turkish child differ from those in the wider social environment, in this case the Dutch one. In order to create the best possible developmental environment for deaf Turkish children in the Netherlands, it is important that family counselors, teachers, and healthcare professionals are aware of these differences and find ways to overcome them. One way to do this is to empower parents in a way that enables them to create a better developmental environment for their deaf child.

Family counselors can play an important role in the empowerment of parents, for they are the link between the different systems in which a child functions, such as the family, preschool, audiological center and hospital. They are also counseling the family immediately after the diagnosis. Possibly the first duty of family counselors is to find ways to convince parents that their child is permanently deaf and that it is essential to start hearing rehabilitation as soon as possible. If they are unsuccessful in this, they have to be aware of other strategies, such as referral to a Dutch-Turkish ENT physician, or involving other Turkish parents with deaf children who can share their experiences. By involving people from the same cultural background who also have experience with deaf children, the parents might be helped to accept the deafness of their child.

Family counselors also can help Turkish parents to optimize the developmental environment for their deaf child with a CI. For this, they and the parents have to discuss the prerequisites for creating this environment, and whether the parents are able to meet them. One of the problems faced by some

Turkish families is that they are not fluent in spoken Dutch, which makes it difficult for them to use this language to communicate with their child. The counselors have to encourage parents to decide at an early stage what will be their child's home language: spoken Dutch, spoken Turkish, or both. Once this has been decided, the counselors can help the parents to learn how to communicate with deaf children, and how signs, body language, and facial expressions can be used in their interaction with them in the chosen language or languages. If the parents are unable to create an optimal developmental environment for their CI child, the family counselors should discuss with them how their immediate social environment, such as relatives and neighbors, can help them to do so. One way to organize and formalize this is through a Family Group Conference, an intervention that empowers parents to regain control over their lives.

Because of the global growth of immigration, it becomes more important to tailor care to the needs of other cultural groups. Empowering parents so that they are able to create a better developmental environment for their deaf child is a method that can also be used for other cultural groups that experience difficulties with the Dutch health care system. However, the strategies that have to be used to empower parents might differ between cultural groups due to differences in values and beliefs.

Linguistic environment

Children's development is directly influenced by the quality and quantity of their interpersonal interactions with parents, teachers, and peers (Bronfenbrenner, 1979). To enhance the quality and quantity of these interactions between children with a CI and their parents, teachers and peers, it is important that everyone involved in the communication enjoys it. If the interactions are enjoyable for both parties, they will communicate more. To achieve enjoyable communication, parents – as soon as the diagnosis is known – have to start learning basic skills regarding communication with their deaf child. These include spoken language, signs, facial expression, and visual cues.

As soon as children have a CI and have access to sound, it is important for them to be exposed to spoken language. Family counselors have to support parents in the use of spoken language after implantation. At first, because the

child's spoken language is still delayed, they should support spoken language with signs. After a year, the child's spoken language skills should be assessed. Then, on the basis of his or her language development, professionals and parents should together decide how to continue. If the child is making good progress in spoken language, parents can stimulate his or her language development by increasing their communication in spoken language. If there is no or little progress in spoken language, the parents should be advised to continue to communicate in spoken language supported with signs, or to switch to Dutch Sign Language.

However, parents are not the only people who have interpersonal interaction with the CI child: others – such as relatives, peers, and teachers – also interact with the child and therefore influence its development. These people should also be involved in creating the best possible developmental environment. In the Netherlands, this means that counseling organizations, schools, and preschools should differentiate more than they do at present.

Finally, for children with a CI who are raised bilingually but do not benefit enough from their CI to catch up with spoken language, it is important to create an environment in which they are exposed equally to spoken language and sign language. This means that schools, universities, and other organizations have to offer intensive sign language programs to parents and teachers.

Stimulating social-emotional development

To facilitate healthy social development in children with a CI, parents and other adults in the child's immediate social environment have to actively teach them emotional and social skills. Social-emotional competence in early childhood involves several skills, such as the awareness and expression of affect, emotion identification, situational knowledge, and emotion regulation (Domitrovich, Cortes, & Greenberg, 2007). The lack of these skills has been associated with peer rejection and internalizing and externalizing behavior (Domitrovich, et al., 2007).

There are various ways in which parents and other adults in the immediate environment can stimulate the development of these skills. First, they can teach the child how to recognize and understand emotions by discussing them. When the child shows an emotion, the parent can ask how he or she feels

and why he feels that way; in this way, the child can learn to understand what kind of feelings are evoked in certain situations. This can also be done when reflecting on past situations, for example when looking at photographs of a birthday or other affective situations.

The second way is by parents and other adults making their own emotions more explicit by telling their child how they feel, and why. They also can show their child how they regulate their feelings, and which strategies they use to improve their emotional well-being.

Third, social competence can be stimulated by helping the child to understand how others feel in prototypical situations, how to give a compliment, how they can solve an argument with peers, and so on. Parents and other adults can do this by explicitly showing their child their own social interactions, but also by discussing the child's social behavior.

For parents, these are not customary things to do: in most families, emotion socialization happens unconsciously, because normal hearing children overhear how adults understand and regulate emotions and how they act in social situations. Parents should thus be supported by family counselors in how to do this.

Education in social-emotional skills should also be provided at school and pre-school. In the Netherlands, several curricula on social-emotional development are available for primary and secondary schools. One of them is Promoting Alternative Thinking Strategies (PATHS), which was found to positively affect social-emotional development (Kam, Greenberg, & Kusché, 2004; Paulussen, 2008). For Dutch preschools, there are no such programs for children aged less than four. Since the delay in social-emotional development starts at a very early age, programs on social-emotional development should be developed for these very young children.

Future research

This thesis shows that the linguistic and social-emotional development of young deaf children with a CI lags behind that of their normally hearing peers. As the age at implantation is still decreasing – a factor that has proved to

be an important factor in children's early spoken-language development – it is unclear how these young implanted children will develop when they are older. To date, studies on the development of older children have involved children who received their CI when they were older than the current generation of newborn deaf children. Further study should thus examine how the young implanted children such as those described in this thesis will develop when they are older. First, longitudinal studies should determine whether the language and social-emotional development of children with a CI catches up with that of their normally hearing peers as they are exposed longer to the hearing world. Second, longitudinal studies are needed to further explore the role of language and emotional competence in the social functioning of children with a CI.

In addition, more extensive study should be devoted to the influence of those in the immediate and wider social environment on the development of children with a CI. This thesis has examined only two aspects of the wider social environment and its relation to the development of children with a CI: the influence of the linguistic environment and the influence of cultural values and beliefs of one minority group. This means that our findings on Turkish parents and their deaf children cannot be generalized to other minority groups in the Netherlands, such as Moroccans. Other studies have shown that non-western immigrants generally experience problems with the healthcare system in their new country, varying from problems in making rehabilitation decisions to the accessibility to healthcare (Eldering, Adriani, Hamel & Vedder, 1999; De Graaf & Eitjes, 2004; Steinberg, Delgado, Bain, Li & Ruperto, 2003; Stern, Yueh, Lewis, Norton & Sie, 2005). Yet, cultural values and beliefs are likely to vary between minority groups. Insight into the specific problems of different minority groups would be gained by a larger study that included parents and deaf children in other minority groups. This would provide fuller understanding of the influence of cultural differences in the immediate and wider social environment on the development of deaf children with a CI.

Emotion socialization is another aspect of the social environment that deserves detailed study. This thesis has shown that the emotional development of children with a CI lags behind that of their normally hearing peers. Studies on the emotion socialization of children with a CI and how parenting styles affect this, might explore whether there are differences in emotion socialization and

parenting styles between children with a CI and normally hearing children that can explain the differences in both language and social-emotional development.

Final conclusion

It can be concluded from this thesis that language development and social-emotional development of young children with a CI in the Netherlands are delayed compared to those of their normally hearing peers. Since the development of children with a CI is influenced by factors in their immediate and wider social environment, it is important that a broader approach be taken to creating an environment that stimulates these children's development. To gain insight into the protective and risk factors for each child, their immediate and wider social setting should be mapped out. Only when these factors are known will it be possible to create an optimal developmental environment for them.

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