



Universiteit
Leiden
The Netherlands

Social-emotional factors underlying internalizing problems and peer relations in deaf or hard of hearing youth

Kouwenberg, M.

Citation

Kouwenberg, M. (2013, April 18). *Social-emotional factors underlying internalizing problems and peer relations in deaf or hard of hearing youth*. Retrieved from <https://hdl.handle.net/1887/20757>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/20757>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/20757> holds various files of this Leiden University dissertation.

Author: Kouwenberg, Maartje

Title: Social-emotional factors underlying internalizing problems & peer relations in deaf or hard of hearing youth

Issue Date: 2013-04-18

Social-emotional factors underlying
Internalizing problems
& Peer relations
in deaf or hard of hearing youth

ISBN 978-90-6464-651-5

Copyright © Maartje Kouwenberg, 2013

Cover design by Patricia Roosenstein

Layout by Maartje Kouwenberg and

Ferdinand van Nispen, Citroenvlinder-DTP.nl, Bilthoven, the Netherlands

Printed by GVO drukkers & vormgevers B.V. | Ponsen & Looijen,

Ede, the Netherlands

This research presented in this dissertation was supported by the Innovative Research Incentives Scheme (a VIDI grant) by the Netherlands Organization for Scientific Research (NWO; to Carolien Rieffe).

Social-emotional factors underlying
Internalizing problems
& Peer relations
in deaf or hard of hearing youth

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van de Rector Magnificus prof. mr. dr. C.J.J.M. Stolker
volgens besluit van het College voor Promoties
te verdedigen op donderdag 18 april 2013
klokke 11.15 uur

door

Maartje Kouwenberg
Geboren op 9 juli 1981
te 's-Gravenhage

Promotiecommissie

Promotor:

Prof. C. Rieffe

Universiteit Leiden
Nederlandse Stichting voor het Dove en
Slechthorende Kind

Co-promotor:

Dr. M. de Rooij

Universiteit Leiden

Commissieleden:

Prof. R.A. Banerjee

University of Sussex

Prof. J.H.M. Frijns

Leids Universitair Medisch Centrum

Prof. H.E.T. Knoors

Radboud Universiteit Nijmegen

Dr. K.H. Wiefferink

Nederlandse Stichting voor het Dove en
Slechthorende Kind

Contents

Chapters

1.	Introduction	7
2.	Methodological issues in the psychosocial assessment of children and adolescents who are deaf or hard of hearing	25
3.	Somatic complaints in children and adolescents who are deaf or hard of hearing	39
4.	Self-reported symptoms of depression in children and adolescents who are deaf or hard of hearing	61
5.	Peer victimization experienced by children and adolescents who are deaf or hard of hearing	79
6.	A balanced and short Best Friend Index	105
7.	Best friends of children and adolescents who are deaf or hard of hearing	115
8.	Discussion	137
	Dutch Summary / Nederlandse Samenvatting	153
	References	163
	Publications	187
	Curriculum Vitae	189





Chapter 1

Introduction

Providing a context

In our world, sounds take a dominant place. For example, sound plays a large role in our communication with others and it provides the means by which we receive information. Taking a deaf or hard of hearing (DHH) person's perspective in this sound-dominated world is challenging for hearing individuals. At general psychology conferences, few studies on the deaf or hard of hearing are presented. To illustrate the hearing audience how it would be to receive information while you cannot fully hear, I imagined starting a presentation just by moving my mouth (with no or soft sound). Lip reading will not be an optimal solution, as only a small percentage of sounds are distinguishable by sight alone. A recent study revealed that only approximately 12% of the words were correctly identified in a sentence recognition task in which no sounds were used (Altieri, Pisoni, & Townsend, 2011). Furthermore, individuals do not always know the person(s) they speak to, and DHH people are missing out on the more social information that is transferred through conversation. In this thesis I had to find another way of illustrating how difficult it is to receive information when you do not have full access. In this thesis I used limited access to the information, but for deaf or hard of hearing it means they have limited access to social information. Consequently, these children have fewer opportunities to (incidentally) acquire social-knowledge.

There is nothing wrong with the print of this thesis. Below the paragraph is repeated with all the words, and in their proper size and color.

In our world, sounds take a dominant place. For example, sound plays a large role in our communication with others and it provides the means by which we receive information. Taking a deaf or hard of hearing (DHH) person's perspective in this sound-dominated world is challenging for hearing individuals. At general psychology conferences, few studies on the deaf or hard of hearing are presented. To illustrate the hearing audience how it would be to receive information while you cannot fully hear, I imagined starting a presentation just by moving my mouth (with no or soft sound). Lip reading will not be an optimal solution, as only a small percentage of sounds are distinguishable by sight alone. A recent study revealed that only approximately 12% of the words were correctly identified in a sentence recognition task in which no sounds were used (Altieri, Pisoni,

& Townsend, 2011). Furthermore, individuals do not always face the person(s) they speak to, and DHH people are missing out on the more subtle social information that is transferred through intonation. In this thesis I had to find another way of reflecting how difficult it is to receive information when you do not have full access. In this paragraph I used limited access to the text, but for deaf or hard of hearing children it means they have limited access to auditory information. Consequently, these children have fewer opportunities to (incidentally) acquire social-emotional knowledge.

Scope

About 1 per 1000 children is born deaf or hard of hearing (DHH) (Korver, Konings, Dekker, Beers, Wever, Frijns, & Oudesluys-Murphy, 2010; Watkin & Baldwin, 2011). During childhood the prevalence increases to 1.65 (and may even double to 2.00) per 1000 children (Fortnum, Summerfeld, Marshall, Davis, & Bamford, 2001; Watkin & Baldwin, 2011). In DHH children who are healthy except for their hearing loss, psychopathological problems are more common than in hearing children. DHH children have been found to experience more internalizing (e.g., depression) and externalizing problems (e.g., aggression) than hearing children (e.g., Konuk, Erdogan, Atik, Ugur, & Simsekiilmaz, 2006; Van Eldik, Treffers, Veerman, & Verhulst, 2004; Van Gent, Goedhart, Hindley, & Treffers, 2007). Also, elevated levels of social difficulties, for example manifested in peer problems, have been noticed in DHH children (e.g., Remine & Brown, 2010; Van Gent, Goedhart, Knoors, Westenberg, & Treffers, 2012; Wolters, Knoors, Cillessen, & Verhoeven, 2011).

These internalizing, externalizing and social problems have often been associated with DHH children's language and communication difficulties (e.g., Dammeyer, 2010; Moeller, 2007; Stevenson, McCann, Watkin, Worsfold, & Kennedy, 2010). Language and communication provide the means by which social and emotional knowledge can be acquired, and relationships with the social surrounding can be formed and maintained. DHH children are living in a sound-dominated world, and 95% of these children are born into hearing families (Mitchell & Karchmer, 2004). Their (in)direct environment (e.g., family and peers) is therefore not always adjusted to DHH children's auditory and visual requirements with regard to communication (Leigh, Maxwell-McCaw, Bat-Chava, & Christiansen, 2008).

Consequently, it is more challenging for DHH children than it is for hearing children to learn (spoken) language, acquire communication skills and, in turn, social and emotional knowledge. For example, it could very well be that DHH children's limited means to communicate with their environment renders them unaware of the significance of social behaviors, such as empathy, in relationships. This implies that, besides the assumption that DHH show less empathy than hearing children, it can be hypothesized that the ones who do express empathy apply this behavior less in peer relations. In sum, DHH children's limited access to their social surrounding could alter associations between DHH children's functioning in certain domains (e.g., peer relations) and related factors typically found in hearing children (e.g., social behaviors). This thesis aims to identify factors underlying internalizing problems and peer relations in DHH children and young adolescents compared to their hearing peers.

There are various reasons to focus on internalizing problems and peer relations in DHH youth, and particularly during late childhood and early adolescence. First, at this age, multiple physical, social and cognitive changes occur at a high pace, making young people more vulnerable to internalizing problems (Graber & Sontag, 2009). Additionally, the perceived importance of social interactions with peers increases during late childhood and early adolescence (Rubin, Bukowski, & Parker, 2006). Best friends become more and more important while, unfortunately, being bullied by peers also reaches peak prevalence (Spence, De Young, Toon, & Bond, 2009). DHH children may be more vulnerable to peer problems due to possible communication difficulties with their overall hearing peers, and them being different from the majority (McCrone, 2004). Second, in addition to having an impact on these young peoples lives, problems emerging at this age can persist into adulthood (e.g., Kubzansky, Martin, & Buka, 2009). Gaining knowledge about potential problem areas at an early stage in life may provide the opportunity to prevent them from turning into more severe problems later on. A third and final reason for this research is that, although children are increasingly able to report on their own functioning during late childhood and early adolescence (Harris, 1989), previous research with DHH children often used proxy reports. Yet, particularly internal states of children, but also interactions with peers, often go unnoticed by parents and teachers (Keller, Lavori, Beardslee, Wunder, & Ryan, 1991). This may even be a bigger issue for hearing parents of DHH children, because it is thought to be difficult for them to share their DHH children's experiences and feelings by means of language (Preisler, Tvingstedt,

& Alström, 2002). Therefore, the majority of studies included in this thesis involve children's self-reports. All in all, there are ample arguments to justify the research reported in this thesis. Before describing the specific objectives of the various studies, a brief introduction on the heterogeneity of the population of DHH children, and the methodological and theoretical approaches will be provided.

Characteristics of DHH children and adolescents

Referring to DHH youth as a single group does not do them justice. DHH children can differ on various characteristics that are typical for being deaf or hard of hearing, such as their **degree of hearing loss**. Moreover, the threshold levels of degree of hearing loss differ across countries. Common classifications in the Netherlands are 41-60 dB for moderate, 61-90 dB for severe and > 90 dB for profound hearing loss in the best hearing ear, which is measured by averaging unaided hearing thresholds at 500, 1000 and 2000 Hertz. To provide a context: the range of conversational speech lies approximately between 30 and 70 dB (Lamoré, Kapteyn, & Franck, 2000). Although one could expect that children with a greater degree of hearing loss have poorer psychosocial¹ outcomes as compared to children with a lesser degree of hearing loss (due to more auditory deprivation of the former group), past studies have shown that children with all degrees of hearing loss experience problems (e.g., Antia, Jones, Luckner, Kreimeyer, & Reed 2011; Dammeyer, 2010; Stevenson et al., 2010).

Nowadays, many young DHH children who have severe to profound hearing loss receive a **cochlear implant (CI)**. A CI is a hearing device that consists of an externally worn microphone and microprocessor converting sound into electrical pulses. Internally, an electrode array implanted in the cochlea transmits the electrical pulses to the auditory nerve. The brain then perceives signals from the auditory nerve as sounds. Although CIs provide part of the population of DHH children with access to sound, these children still do not have the same quality of sound perception as children with normal hearing. Numerous studies have documented the advantages and benefits of CI for children's linguistic and academic development (e.g., Beadle, McKinley, Nikolopoulos, Brough, O'Donoghue, & Archbold, 2005; Fagan, Pisoni, Horn,

¹ Psychosocial is used in this context as an umbrella term for psychopathological and social problems.

& Dillon, 2007; Yoon, 2011), but knowledge about these children's psychosocial functioning is only burgeoning.

Another factor causing heterogeneity within the DHH population is attendance to **mainstream or special education**. The percentage of DHH children that is educated in mainstream schools is increasing in the Netherlands (Knoors, 2007), a phenomenon that is seen in many countries (Nikolarazi & Hadjikakou, 2006; Reed, Antia, & Kreimeyer, 2008). Children in mainstream schools show academic performances similar to hearing peers, but their functioning in the psychosocial domain remains less clear (cf. Eriks-Brophy, Durieux-Smith, Olds, Fitzpatrick, Duquette, & Whittingham, 2006). For example, some results indicate that DHH children in mainstream schools are more often excluded and neglected (Brunnberg, 2005; Wolters et al., 2011), while others suggest that these DHH children are doing well socially (e.g., Eriks-Brophy et al., 2006).

DHH children can furthermore differ in their preferred **mode of communication**; sign, sign supported or spoken language. A sign supported language uses the syntax (i.e., rules that govern the order of words) of the spoken language, and is supported with signs from the sign language of a country. Sign languages are natural languages with their own syntax and semantics (Bavelier, Newport, & Supalla, 2003). It remains a matter of debate whether the use of sign (supported) language is associated with DHH children's psychosocial outcomes (e.g., Kushalnagar, Topolski, Schick, Edwards, Skalicky, & Patrick, 2011; Polat, 2003; Stevenson et al., 2010; Van Gent et al., 2007). Moreover, communication mode is not an isolated aspect from the other DHH-related characteristics. School choice, for example, affects communication mode, and vice versa. To illustrate: schools for DHH children in the Netherlands have a bilingual teaching philosophy in which children are educated in spoken language supported by sign and in sign language (Knoors, 2007). Furthermore, DHH children with higher spoken language levels have been found to attend mainstream education more often (Fellinger, Holzinger, Beitel, Laucht, & Goldberg, 2009). Many DHH-related characteristics are, to some extent, related to each other and should therefore be examined simultaneously.

As mentioned previously, the majority of DHH children has hearing parents (Mitchell & Karchmer, 2004). However, approximately 5% of DHH children is born from one or two DHH parent(s). So, DHH children can vary on having **hearing or DHH parents**. In some domains of functioning the group of DHH children from DHH parents is found to function equal as compared to hearing children

from hearing parents. For example on perspective taking skills (Peterson, 2009; Woolfe, Want, & Siegal, 2002) or reading ability (Goldin-Meadow & Mayberry, 2001). The reason behind this equality is that DHH children from (signing) DHH parents have the opportunity to share language, experiences and feelings with their parents from an early age onwards. Due to the low prevalence it is difficult to include these children in research. In the current research, one DHH child born from DHH parents was included.

Finally, approximately 25 to 30% of the DHH population has **disabilities in addition** to their hearing loss, such as specific learning disabilities or a developmental delay (Fellinger, Holzinger, & Pollard, 2012; Fortnum, Marshall, & Summerfield, 2002; Punch & Hyde, 2011). In the current thesis these children were excluded from the sample. The aim was to examine the influence of hearing loss on internalizing problem behaviors and peer relations without undue influence of diagnosed disabilities. This reduces the possibility that any dissimilarity found between hearing and DHH children could be explained by these other disabilities.

Methodological approach

The developmental psychopathology framework

Four key principles of the developmental psychopathology framework (Cicchetti & Toth, 2009; Cummings, Davies, & Campbell, 2000) guided the research on DHH youth's internalizing problems and peer relations described in this thesis. First, according to this framework both typical and atypical or at-risk samples should be examined. The study of typically developing samples enhances our understanding of atypical development, and vice versa (Halberstadt, Denham, & Dunsmore, 2001). The population of DHH children is assumed to develop dissimilar from hearing children due to sustained auditory deprivation from birth or from an early age onwards. Comparing the functioning of hearing (i.e., typically developing) and DHH children can help identifying possible hurdles for DHH children.

Second, the developmental psychopathology framework emphasizes examination of a range of outcomes, as well as studying multiple underlying or related factors. Examination of a single outcome and underlying factor might lead to spurious

conclusions if generalizations are made exclusively based on that outcome and/or factor (Cicchetti & Toth, 2009).

In line with the second principle, a third principle of this framework is to move beyond descriptive facts (i.e., means or mean differences) to a process level of studying psychosocial functioning. The process(es) underlying the same outcome can be quite different for different individuals. In the case of hearing and DHH children this implies that mean outcome scores may be equal for both groups, but the factors leading to that outcome can be different. Moreover, these differences are not necessarily maladaptive for DHH youth, but could just be different from the hearing norm. Differences may even reflect an adaptive way of dealing with their auditory deprivation.

Fourth, the developmental psychopathology framework emphasizes the study of dynamic interactions between social contexts and individuals (over time). This final principle is consistent with the social-ecological theory of Bronfenbrenner (1979). Multiple factors and outcomes occur across multiple contexts, for example, at the child-level (e.g. children's emotional functioning), the family-level (e.g., parental behaviors), or at the peer-level (e.g., friends or the larger peer group). The child is at the center and is surrounded by these social contextual layers with which they interact.

Assessment approach

As described above, the exploration of both typically and atypically developing samples is theoretically informative. However, the study of an atypical sample involving children who are deaf or hard of hearing does entail methodological issues concerning assessment. Not all DHH children can be presented with assessment tools in an equal fashion as typically developing, hearing children. For example, many DHH children have reading problems (cf. Ganek, McConkey Robbins, & Niparko, 2012). When ignored, these reading problems are likely to invalidate results obtained by means of written questionnaires. DHH children might not understand the questions and give random or incorrect answers. Questionnaires should therefore be short and have relatively simple syntactic and semantic structures. Particularly the DHH children who prefer to use sign (supported) language may have problems with questionnaires in written form. To assess these children's self-reported internal states and peer relations, questionnaires should also be offered in sign language. These and other

methodological considerations that have been accounted for in conduct of this research will be presented in chapter 2.

Statistical approaches

Comparing two groups of children on associations between internalizing problems, peer relations and their underlying factors carries with it statistical implications as well. First, one can fit models for each group separately and examine which factors contribute to internalizing problems or peer relations in each group separately (Figure 1). In this case, two regression analyzes are performed; one for the DHH sample and one for the hearing sample.

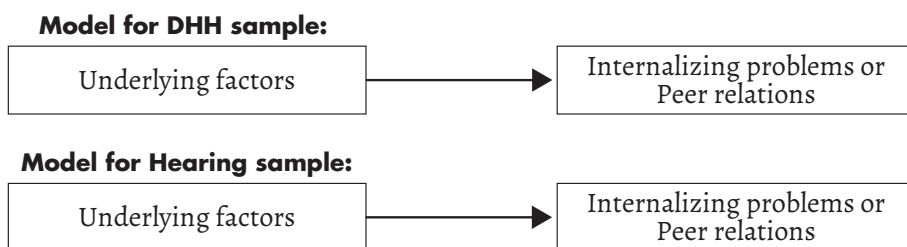


Figure 1. Two separate models: one for the DHH sample and one for the hearing sample

However, by using this approach, possible group differences in the associations between internalizing problems / peer relations and their underlying factors cannot be statistically tested. To reach the aim of comparing groups directly with each other, a second method is to carry out one multiple regression analysis with interaction terms. These interaction terms entail the interactions between group membership (i.e., either DHH or hearing) and the underlying factors (Figure 2). Basically, in this multiple regression analysis the so-called ‘moderating effect’ of group membership on the relation between internalizing problems / peer relations and their underlying factors is examined. Recall the example in which social behaviors have an effect on peer relations in hearing children. The moderating effect of group membership implies that the hearing sample and the DHH sample (i.e., the two groups) are directly compared with each other on the association between social behaviors and peer relations. This second method offers the possibility to draw stronger conclusions about group differences (or equalities) than the first method.

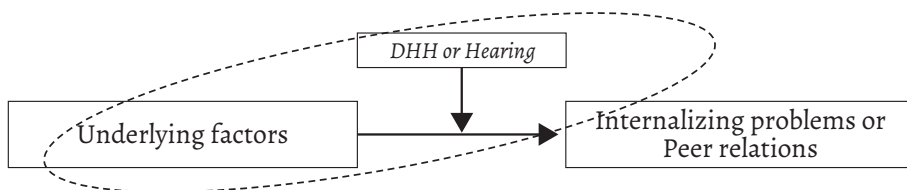


Figure 2. Schematic representation of the interaction effect of group membership (i.e., being DHH or hearing) and underlying factors on internalizing problems or peer relations

Theoretical approach

This research seeks to identify factors underlying internalizing problems and peer relations in DHH children. The presumed relations between these factors and internalizing problems / peer relations are grounded on theoretical models gained from research with typically developing children. In these models, emotional functioning is thought to be an important mechanism underlying both internalizing symptoms and peer relations (Denham et al., 2003; Zeman, Shipman, & Suveg, 2002). Children who are aware of their emotions and have the ability to manage and express their emotions in an appropriate manner, are less prone to develop internalizing problems and more likely to have successful peer interactions.

DHH children have been found to show various problems within the domain of emotional functioning (cf. Rieffe, 2012). For example, DHH children are less capable of distinguishing between different negative emotions. Additionally, they are limited in their strategies to regulate their negative emotions. DHH children's problems within the emotional domain do not appear to be peculiar, given the fact that the social surrounding plays an important role in acquiring emotion knowledge. Hearing children, whose parents frequently discuss emotions with them, have been found to display enhanced levels of emotion understanding when compared to children of parents who discuss emotions less frequently (Denham, Renwick-DeBardi, & Hewes, 1994). Previous results with hearing parents and their DHH children suggest that their interactions lack conversational depth and detail (Lederberg & Everhart, 2000; Preisler et al., 2002). Possibly, these conversations do not contain many exchanges between parent and child about abstract topics like emotions. Moreover, DHH children have fewer opportunities than their hearing peers to acquire emotion

understanding by incidental learning, for example by overhearing other people's conversations (Calderon & Greenberg, 2003).

In the next sections, underlying factors under study will be explained in more detail. This will be done separately for each of the internalizing problem behaviors and peer relations explored in this thesis.

Internalizing problems

Somatic complaints The first form of internalizing problems that is focused on in this thesis, is somatic complaints. Somatic complaints are physical complaints (e.g., headache and stomach ache), which cannot be explained medically (Croffie, Fitzgerald, & Chong, 2000). Past studies on the prevalence of these complaints in DHH children compared to their hearing counterparts, revealed mixed results (Kent, 2003; Van Eldik, 2005; Van Eldik et al., 2004). Knowledge about the prevalence and mechanisms underlying these problems in DHH children is vital, because somatic complaints are a problem in themselves, and have been found to cause social and academic difficulties (Torsheim, Aaroe, & Wold, 2001).

Emotional functioning is thought to contribute to the development of somatic complaints, because emotions have a physiological component. Consider the increased breathing-, hearth rate, and muscle tension you experience when you are angry. When anger (but also other negative emotions) is not adequately managed, the emotion and its physiological elements linger and negative mood states can arise (Scherer, 2000). These negative mood states can amplify and prolong the physiological stress reactions, and can ultimately lead to somatic complaints (Segerstrom & Miller, 2004). As mentioned before, DHH children have been found to be limited in their (negative) emotion regulation strategies and, consequently, they experienced prolonged negative mood states (Rieffe, 2012).

Another factor that is thought to increase somatic complaints in hearing children is their competence in dealing with daily stress situations (i.e., so-called sense of coherence, Antonovsky, 1993). Children with a low sense of coherence evaluate possible negative situations as hopeless to control. Subsequently, these children experience enduring stress levels, which can turn into potentially harmful tension (Torsheim et al., 2001). There are indications that DHH children experience lower levels of sense of coherence than their hearing counterparts (Rieffe, Meerum Terwogt, & Smit, 2003). The question remains whether their sustained negative mood states and low levels of sense of coherence are causing increased levels of somatic complaints in DHH children.

Depressive symptoms Emotional functioning has also been assumed to be at the root of another form of internalizing problems, i.e., depressive symptoms (Rieffe & De Rooij, 2012). Depressive symptoms are characterized by a persistent feeling of anhedonia and sadness or despair. In previous studies, DHH children reported increased levels of depressive symptoms compared to hearing children (Konuk et al., 2006; Van Eldik et al., 2004). Regarding this form of internalizing problems, particularly the awareness of emotions has been found to be crucial. Emotion awareness refers to the ability to identify and differentiate between emotions, and to understand the causes of emotions (Rieffe, Oosterveld, Miers, Meerum Terwogt, & Ly, 2008). There are indications that DHH children have lower levels of emotion awareness (Rieffe, 2012). Lacking the ability to identify which emotion you are feeling or what causes it, hampers you in the regulation of the emotion and, in the long run, can lead to depressive symptoms.

Besides their problems within the domain of emotional functioning, DHH children are experiencing many social difficulties. For example, DHH children reported a lower understanding of other individuals' actions and feelings (Peterson & Wellman, 2009), and showed more peer problems than hearing children (cf. Remine & Brown, 2010). It is not hard to imagine that the misunderstanding of others and/or peer difficulties can lead to children showing withdrawn, internalizing behaviors. In fact, social maladaptation has been hypothesized to be an important factor underlying children's development (Pritchard & Woollard, 2010). This means that children's social interactions, combined with their own active participation, can determine the development of internalizing problems, such as depressive symptoms. Because DHH children are known for their multiple social problems, social factors may play a key role in the development of depressive symptoms. Therefore, in this thesis, both emotional- and social factors are examined in relation to depressive symptoms in DHH and hearing children. As described above, social factors may play a key role in the development of internalizing problems in DHH children. We are also interested in social functioning as an outcome and which factors underlie it. In this thesis we focus on peer relations as an index of social functioning.

Peer relations

Victimization The first peer relation that is examined in this thesis is victimization. Victimization occurs when a child receives negative attention or behavior from one or more other children repeatedly over time (Crick, 1995). DHH children

are thought to be particularly vulnerable for being targets of victimization (McCrone, 2004). However, thus far inconclusive findings have been found, with some studies reporting that DHH are more often victimized than hearing children and others failing to find a difference (Bauman & Pero, 2010; Kent, 2003; Wauters & Knoors, 2008).

The emotional problems underlying victimization in hearing children are the dysregulation of emotions and, in turn, the expression of heightened levels of anger and sadness (Camodeca & Goossens, 2005; Spence et al., 2009). In this respect, sadness is associated with withdrawn behavior and anger with provocative, aggressive behavior; behavioral patterns that decrease the chance of successful peer interactions. DHH children have been found to express their anger more openly than hearing children, and to show more internalizing, withdrawn behavior (Hosie et al., 2000; Rieffe & Meerum Terwogt, 2006; Theunissen, Rieffe, Kouwenberg, De Raeve, Soede, Briare, & Frijns, 2012).

Besides children's own emotional functioning, social factors, such as parental behaviors are also thought to be important in relation to children being victimized (Swearer & Espelage, 2004). For example, parents who treat children as younger than their age, and parents who are less sensitive and responsive to their children's needs enhance the chance of their children being victimized (Bowers, Smith, & Binney, 1994; Ladd & Kochenderfer-Ladd, 1998). Research on the interactions between parents and their DHH children when these children are in their teens is scant. Research with preschool DHH children found that parents of DHH children are less sensitive and responsive to their children's needs than parents of hearing children (Meadow-Orlans & Steinberg, 1993). However, other studies did not find this difference (Pressman, Pipp-Siegel, Yoshinaga-Itano, & Deas, 1999). It is plausible that communication barriers between hearing parents and DHH children get in parents' way from acting as they would with hearing children. The first question we set for ourselves is whether children's hearing loss alters the usual parental behaviors as seen with hearing children (i.e., mean levels). Second, whether these parental behaviors are differently associated with DHH children's chance of being targets of victimization as compared to hearing children.

Friendships The second peer relation that is examined in this thesis is a child's best friendship. A best friendship is defined as a strong and affective connection between two individuals (Hartup & Stevens, 1997). Best friendships may be

particularly significant for the increasing number of DHH children that is being educated in mainstream schools, because a close friend increases DHH children's inclusion with hearing peers (Punch & Hyde, 2011). Evidently, this peer relationship is important for all children, because it is thought to protect against psychopathology and victimization (La Greca & Harrison, 2005; Vitaro, Boivin, & Bukowski, 2009). However, some studies have shown that DHH have fewer friends than hearing children (Kluwin, Stinson, & Colarossi, 2002; Nunes, Pretzlik, & Olsson, 2001). Moreover, there are indications that the friendships that DHH children have formed are of lower quality as compared to friendships between two hearing children (Gilman, Eastbrooks, & Frey, 2004; Van Gent et al., 2012).

In a close friendship, it is vital to understand and incorporate others' emotional signals (Halberstadt et al., 2001). If these signals from others are not noticed, children can have difficulties adjusting their own emotional messages, are less capable to follow the social interaction process, and are less likely to react appropriately. The ability to accurately perceive and understand another person's emotions and to react to these emotions with appropriate prosocial behavior is known as empathy (Eisenberg & Strayer, 1987). DHH children are frequently found to be impaired in their ability to take another person's perspective (Peterson & Wellman, 2009), while also problems in their prosocial abilities have been reported (Wauters & Knoors, 2008; Wolters et al., 2011).

Whereas empathic abilities increase the quality of friendships, expression of the own anger in an overtly aggressive manner is likely to cause a decrease in friendship quality (Cillessen, Jiang, West, & Laszkowski, 2005). Findings regarding overt aggressive behavior displayed by DHH children as compared to hearing children are mixed (Remine & Brown, 2010; Van Eldik, 2005; Van Gent et al., 2007; Wolters et al., 2011). Yet, in light of the current thesis, more important than absolute mean levels of certain (anti)social behaviors are the associations between empathy, aggression and friendship quality. Past research indicated that DHH children have limited understanding of the significance of empathy and low levels of aggression in peer interactions (Rieffe & Meerum Terwogt, 2006). Therefore, the relations between empathy, aggression and friendship quality are explored in DHH children as compared to their hearing counterparts.

1

Notes on terminology

Psychopathological and social problems have been denoted 'psychosocial functioning' in this introduction. The underlying factors have been called social- or emotional functioning. These catch-all terms are used to facilitate the differentiation between outcomes (i.e., internalizing problems and peer relations) and their underlying factors, but we are aware that all can fall under the terms 'psychosocial'- or 'social-emotional' functioning. Furthermore, we are aware that the differentiation between truly 'emotional' or 'social' factors is complex, because emotions receive their meaning in social interactions (Halberstadt et al., 2001). Though, we hypothesize that (understanding) the emotions of oneself does not involve other individuals directly and is viewed as an emotional factor, while understanding the emotions and thoughts of others does involve other individuals and is seen as a social factor. This thesis represents independent manuscripts, and therefore some discrepancy on terminology throughout the thesis is unavoidable. For example, the emotional factors are categorized as individual or intrapersonal factors, and the social factors as social environmental or interpersonal factors. Though, in each chapter the exact factors are explained in detail. Finally, the distinction between factors and outcomes is controversial, because what is considered an outcome in one process can very well be a predictive factor in another process, depending on which variables and relations are being examined. Nonetheless, for clarity reasons we stick to the terms factors and outcomes, because in each study they are operationalized as such.

Objectives of this thesis

Our aim was to investigate how social-emotional factors are associated with internalizing problems and peer relations in DHH youngsters as compared to their hearing counterparts. Additionally, we aimed to investigate how certain DHH-related characteristics influenced DHH children's internalizing problem behaviors and peer relations. Understanding these associations is important with respect to the enhancement of intervention and prevention options, predicting the developmental prospects, but also to provide directions for future research. Internalizing problems and peer relations were investigated as dimensions of

functioning and not as dichotomous constructs by dividing the sample in, for example, ‘those with problems’ and ‘those without problems’. This was motivated by the fact that some children may be at the brink of having problems, but just fall outside selected criterion-levels. By examining dimensions of functioning we can study a community population in which children with little or no problems, but also those experiencing more problems are included.

Outline of the chapters

Chapters 2 until 7 represent independent manuscripts. Some content overlap between them is therefore inevitable. **Chapter 2** describes the various methodological issues and concerns that should be considered when conducting research with children and adolescents who are DHH. Chapter 3 and 4 describe two studies that focus on internalizing problems in DHH children as compared to hearing children. **Chapter 3** investigates somatic complaints and associations with mood states and sense of coherence, while **Chapter 4** describes prevalence of depressive symptoms and associations with emotion awareness, self-esteem, Theory of Mind, being victimized, and delinquent behavior. The main objective of chapters 5, 6, and 7 is the peer relations of children and young adolescents. In **Chapter 5** it is examined how parental behaviors and children’s own mood states are associated with them being victimized by peers. **Chapter 6** presents the development of a short and balanced Best Friend Index in typically developing children. This Best Friend Index is used in **Chapter 7** in which friendship quality, friendship stability and (longitudinal) associations with empathy and aggression are investigated in DHH children as compared to hearing children. Finally, outcomes from these independent manuscripts are integrated in **Chapter 8**. In this chapter, the key findings and suggestions for future research will be discussed.





Chapter 2

Methodological issues in the psychosocial assessment of children and adolescents who are deaf or hard of hearing.

Submitted as: Methodological issues in the psychosocial assessment of deaf or
hard of hearing youth

Maartje Kouwenberg, Carolien Rieffe, Stephanie C.P.M. Theunissen,
& Sigrid Kok

Abstract

2

Children and young adolescents who are deaf or hard of hearing (DHH) have been found to experience more psychosocial problems when compared to their hearing counterparts. These results are often obtained by using assessment tools that have been validated for use with hearing children. Using these tools in a similar fashion with DHH children, while ignoring certain deaf-related characteristics, may lead to unreliable or invalid results. Researchers and educational- and clinical psychologists could benefit from an in-depth overview of methodological issues, examples, and recommendations in conducting psychosocial research with DHH youth. Thus far, such an overview has not been provided. Based on our longitudinal research with this particular group, the current article aims to address this gap in the literature and offers guidelines for self-reports for use with DHH youth.

Introduction

Psychosocial research with children and young adolescents who are deaf or hard of hearing (DHH) has increased rapidly over the past few decades (e.g., Hintermair, 2011; Leigh, Maxwell-McCaw, Bat-Chava, & Christiansen, 2008; Van Gent, Goedhart, Knoors, Westenberg, & Treffers, 2012). Various methodological issues and concerns should be considered when conducting psychosocial research with this particular group. Such concerns have already been reported back in 1964 by Vernon and Brown, who published a “guide to the basic intelligence and personality tests found to be most suitable for assessment of deaf children” (p. 414). Besides the fact that this guide is almost 50 years old, the authors limit themselves to considerations of case history data, and the use of sign language interpreters familiar with psychology and testing. Two other considerations they put forward are whether norms for hearing children are appropriate for DHH children, and possible communication problems experienced by DHH children. More recent articles and book chapters regarding accommodations or concerns in the assessment of DHH participants’ functioning address intelligence tests (cf. Maller, 2003), language tests (e.g., Cawthorn, Winton, Garberoglio, & Gobble, 2011; Enns & Herman, 2011; Lollis & LaSassa, 2009), or mathematic tests (Cawthorn and Online Research Lab, 2006, 2008). Others have considered the examination of more severe psychological problems, such as hallucinations, delusions and thought disorders, in deaf adults with severe language deprivation (Glickman, 2007). Recommendations from these sources are valid, but we aim to illustrate, in a more detailed fashion, the methodological issues in developing and adjusting psychosocial assessment tools that are suitable for a community sample of DHH youth. With the present article we intend to provide a practical reference for researchers, but also for psychologists interested in assessing the psychosocial functioning of their young DHH clients. First, we will outline various frequently used methods to assess psychosocial functioning. Second, we will provide recommendations for developing and presenting self-report questionnaires to DHH youth. Third, a step-by-step guide to achieve an assessment tool that is suitable for DHH youth is given. These considerations and recommendations are derived from our own longitudinal research on the psychosocial functioning of DHH children and young adolescents.

Various assessment tools

Different methods can be used to gather knowledge about psychosocial functioning of (DHH) youth. Frequently used methods are child interviews, peer ratings and nominations, observations and questionnaires. Each of these methods and its (dis)advantages is addressed separately below.

Child interviews provide the opportunity to gather information about children's functioning in their own words (Sattler, 1992). An advantage of obtaining information in the participants' own words is the increased accuracy of answers (Morrison & Anders, 2001). Additionally, with this method unforeseen information may be gathered, as answers are not restricted to requests for specific information (Morrison & Anders, 2001). However, a limitation of relatively unstructured interviews is that certain domains of functioning may be overlooked (Meyer et al., 2001). Furthermore, during the turbulent years in which (pre)adolescents become increasingly aware of themselves, they are reluctant to share their private feelings directly with an unfamiliar adult researcher or psychologist (Orr & Ingersoll, 1988). Particularly for DHH children who are using sign or sign supported language, a further drawback of the interview methodology is the necessity of a researcher fluent in sign (supported) language or an interpreter. The reflection of a DHH individual's affect by an interpreter is a somewhat subjective process (Pollard, 1998), which can alter outcomes.

In *peer ratings and nominations*, children are asked to rate all of their peers or to nominate three to five peers on certain characteristics and behaviors. An advantage of ratings and nominations is that they give a reflection of children's social reputation or social functioning in class (Juvonen, Nishina, & Graham, 2001). Yet, this limits research outcomes to children's functioning *within* class, while their functioning outside school grounds remains unknown. We hypothesize that there is a discrepancy between 'inside' and 'outside' school, particularly for DHH children in special education, due to their inexperience interacting with (overall) hearing peers outside school. Furthermore, DHH children in special schools are often educated in classes with few children, making results from peer ratings and nominations questionable and difficult to compare to those obtained from children in mainstream education.

In mainstream education, in turn, DHH children's hearing classmates may misinterpret DHH children's behaviors or characteristics (Stinson & Liu, 1999). For example, DHH children are more easily distracted and need more visual prompts to react than hearing children (Corina & Singleton, 2009). When, as a result of these characteristics, DHH children do not respond to cues from their social surrounding, this may be interpreted by hearing classmates as being less (pro)social.

Observations refer to watching and analyzing children's naturally occurring behavior (cf. Banister, Burman, Parker, Taylor, & Tindall, 2011). An advantage of observations is that they have a more objective nature than children's own reports, because observations represent the normative perspective of phenomena (Vernberg & Biggs, 2010). Though, this method is limited by low occurrence rates and reactivity of many behaviors, as well as the covert nature of internal states such as depressive feelings (Achenbach, McConaughy, & Howell, 1987). Furthermore, it fails to measure interactions between children and their peers, such as being bullied (Vernberg & Biggs, 2010).

When *questionnaires* are used as an assessment tool, the first subject to consider is the choice of informant (i.e., parent-, teacher- or self-reports).

- An advantage of *parent- and teacher-reports* is that the parent or the teacher knows the child for a longer period of time. Therefore, it can be hypothesized that these informants provide a more balanced picture of the child's daily functioning than, for example, an unfamiliar observer. However, it has also been assumed that teachers' knowledge of the child is limited, for instance, with regards to the child's home situation (Dammeyer, 2010). Moreover, a large study has shown that parents overestimate the health and well-being of their (hearing) children (Waters, Stewart-Brown, & Fitzpatrick, 2003) and consequently, underdiagnose problems. Underdiagnosis might be a particular point of concern in research with DHH children, due to communication barriers between them and their overall hearing parents (Connolly, 2006). Parents of DHH children with a cochlear implant (CI) have indeed been found to rate their children's social functioning too positive (e.g., Dammeyer, 2010; Percy-Smith, Caye-Thomasen, Gudman, Jensen, & Thomsen, 2008).
- *Self-reports* are the primary method for assessing children's subjective experience of their own well-being (Hays et al., 1995). Yet, this subjective

experience can be viewed as a disadvantage, as well as the fact that self-reports can be tedious to answer for children, the plausible response biases and memory errors. Moreover, many DHH children experience reading difficulties (cf. Ganek, McConkey Robbins, & Niparko, 2012), which may invalidate the results of written self-reports. On the other hand, particularly subjective experiences have been found to be related to future psychosocial functioning (Ma & Bellmore, 2012). Furthermore, self-reports provide the opportunity to collect data about children's functioning in domains that are unknown or invisible for parents and teachers. In fact, past research has shown that self-reports are the recommended method for examination of the (subjective) internal processes of children and adolescents (Betts, Gullone, & Allen, 2009).

It is quite evident to use multiple data collection methods simultaneously to obtain a comprehensive view of children's functioning. For one of these methods, that is, self-reports, we will outline methodological issues and recommendations for use with DHH youth. It should be noted that the self-report methodology cannot be applied to children with language or intellectual disabilities (e.g., Hays et al., 1995). For alternative assessment methodologies for use with DHH children, refer to Cawthon and colleagues (2006; 2008).

Presenting self-reports to DHH youth

1. *Mode of language.* When developing a psychosocial self-report questionnaire, one ought to bear in mind that the main aim is examination of psychosocial functioning. So, DHH participants' mental health problems should not be confused with, or confounded by, their frequently occurring language problems (Pollard, 1998). The likelihood that participants misinterpret a question due to language problems should therefore be minimized. The first issue to consider is the language or communication mode in which a questionnaire should be presented (Cawthon & Online Research Lab, 2006, 2008). Some DHH children are fluent in spoken language, and some in sign language. Others use sign supported language in which the syntax (i.e., rules that govern the order of words) of spoken language is used, which is supported with signs from the sign language. However, this mixed form does not have official language rules, whereas sign languages are natural languages with their own syntax and

semantics (Bavelier, Newport, & Supalla, 2003). It is recommended to establish for each individual participant which language they are most proficient in, and to present the questionnaire in that particular language. This is underscored by results of increased reliability of a signed version of the Youth Self Report compared to the written version, in a sample of signing DHH children (Cornes, Rohan, Napier, & Rey, 2006).

Moreover, language tests can be administered to DHH children to determine whether their level of (sign) language proficiency is sufficient to understand the psychosocial questionnaires. Although these tests are not available for all sign languages, sign language proficiency tests have been developed for some; e.g., British Sign Language (BSL; Herman, Holmes, & Woll, 1999) or Sign Language of the Netherlands (SLN; Hermans, Knoors, & Verhoeven, 2010). A list and summary of sign language assessment measures has been developed by Tobias Haug (see www.signlang-assessment.info).

2. Translation of the items. A second, related to the first, issue is translation of the items from the spoken language into the sign language. Hambleton, Merenda, and Spielberger (2005) published a book on the theoretical and methodological issues in translating psychological tests from a spoken language of one country into the spoken language of another country. However, they do not address different modalities of a language within one country. When items from a spoken language are translated into a sign language, researchers should first be aware of the fact that different sign-variants (often based on different regions) may exist within one country. It is advised to use the sign-variant that is known by the research sample. Second, researchers should understand the complexity of literal translation from a spoken into a sign language. In reality, they have to go beyond a literal translation and find concepts, words and expressions that are culturally, psychologically and linguistically equivalent in the other language (Hambleton et al., 2005). This is called adaptation. For example, the Dutch spoken language is less specified as compared to SLN. Items from written versions of psychosocial questionnaires frequently include the terms ‘something’ or ‘things’ (e.g., ‘My friend and I do nice *things* together’). We suggest adapting these phrases into more specific terms or wording (e.g., ‘My friend and I do nice *activities* together’). Additionally, the structure of the original sentence must be followed as closely as possible in the translation into the sign language structure; i.e., not the word order of the spoken language should be used (cf. Livingston,

Singer, & Abrahamson, 1994). Third, we propose to carry out translations by a qualified sign language interpreter, after which back translation by another interpreter must confirm that original and translated items show convergence. Subsequently, it should be statistically tested whether the translated questionnaire measures the same construct(s) in the same way as the original questionnaire (cf. Sireci, Patsula, & Hambleton, 2005). This measurement equivalence (or difference) can, for example, be established at the item level or at the structural level of the questionnaire. At the item level, Differential Item Functioning (DIF) analysis can reveal whether an item functions differently across language groups (Osterlind & Everson, 2010). The translated item may be easier, harder, or measure a different construct than the original item. Therefore, these so-called 'DIF items' should be removed from the questionnaire. Establishment of structural equivalence of different language versions can be done with Confirmatory Factor Analysis or Multidimensional scaling (cf. Sireci et al., 2005). With these two techniques the factorial structure from multiple (language) groups can be compared directly.

3. *Grammar of the items.* A third issue concerns the grammar of the questionnaire items. It has been well reported that DHH children in general experience language problems. For example, the majority of DHH children score below grade level on reading comprehension tests (see Musselman, 2000, for review; Traxler, 2000). This issue is particularly valid for DHH children who are presented with written versions of questionnaires. Although DHH children with a CI are generally better readers than DHH children with regular hearing aids, and a few studies report that some of these CI children even achieve age-appropriate reading scores, many do not (e.g., Fagan, Pisoni, Horn, & Dillen, 2007; Ganek et al., 2012). Therefore, complicated vocabulary and linguistic structures, such as conditionals (e.g., sentences with 'if'), passive sentence structures, words with multiple meanings and lengthy sentences, ought to be avoided as much as possible (cf. Cawthon, 2011; Lollis & LaSasso, 2009).

An additional advantage of avoiding lengthy sentences is the reduction in working memory resources, since working memory has been found to be shorter in DHH children as compared to hearing children (cf. Banks, Gray, & Fyfe, 1990; Cleary, Pisoni, & Geers, 2001). An example from our own research to reduce working memory resources concerns the adaptation of a questionnaire for measuring depressive symptoms, i.e., the Child Depression Inventory (CDI; Kovacs, 1985).

In the original questionnaire each question consists of three sentences. These three sentences reflect the degree by which the symptom is experienced (e.g., 'I feel like crying sometimes'; 'I feel like crying many days'; 'I feel like crying every day'). In the adapted version, these three sentences were converted to one sentence with three response categories, i.e., 'I feel like crying', with the response categories: '*sometimes, many days, or every day*' (refer to Kouwenberg, Rieffe, & Theunissen, 2011). Applying this to an entire questionnaire considerably reduces both reading time and the need for working memory.

4. *Semantic content of the items.* A fourth issue worth considering is the semantic content of the questionnaire items. Existing questionnaires may incorporate items inappropriate for DHH children. For example, a questionnaire on coping with problems includes an item about 'distracting oneself by reading a book'. As mentioned previously, DHH children often experience reading difficulties (cf. Fagan et al., 2007; Ganek et al., 2012). When a DHH child answers this question negatively, a researcher or psychologist is not able to discern whether this negative answer derives from children not searching for distraction as coping strategy, or because DHH children dislike reading in general. These ambiguous questions could lead to invalid conclusions and should be avoided in questionnaire development. Nonetheless, with the aforementioned DIF analysis it can be statistically established whether an item functions differently for DHH children as compared to hearing children. Finally, the use of idioms, proverbs and expressions should be excluded in questions, because these are the most difficult language aspects to learn (Glickman, 2007). Moreover, previous research has shown that DHH children do score lower on these figurative language aspects than their hearing peers (Paul, 2003). When adapting the items of a questionnaire because of these issues concerning semantic content, but also translations and grammar, beware that the intended meaning of the items is not altered, thereby invalidating the test outcomes (Crawford & Tindal, 2004).

5. *Presentation of the items.* After all the above-mentioned issues have been dealt with, a fifth issue concerns the *manner* in which the self-report questionnaires are presented to the children. Self-reports in typically developing children are frequently presented in written form, in which children can choose from multiple response categories. This enables children to read, consider, and answer the questions at their own pace and with a sense of anonymity. To guarantee

these aspects in DHH children who are proficient in sign (supported) language, questionnaires can be presented in short movies on a computer screen. In our studies (e.g., Kouwenberg and colleagues, 2011, 2012; Theunissen et al., 2011) each item was presented one at a time with response buttons beneath. Children were able to repeat the movies as many times as they desired. After an answer was given, the next item appeared automatically. This method offers a great potential for standardization, reduced error, and minimizes the influence of a test administrator (Enns & Herman, 2011). Furthermore, it has been found that (hearing) adolescents perceived more anonymity, and had a more positive attitude toward computerized data collection than those who completed paper forms (Supple, Aquilino, & Wright, 1999). Presenting questionnaires to children by means of a computer addresses also the need for an interpreter and its associated problems. Nonetheless, to answer possible questions of DHH children proficient in sign (supported) language, the presence of a person with sign language skills is preferred during questionnaire completion. Finally, computerized data collection offers the possibility of testing children at home through an internet connection. In that case children could ask questions by way of (video) chat.

Step-by-step guide to achieve self-report questionnaires suitable for DHH youth

We have identified seven steps that need to be taken into account when developing a psychosocial self-report questionnaire suitable for DHH children and adolescents. Points 3 through 6 are necessary only when items are translated into sign language.

1. Ensure the questionnaire has a relatively easy syntactic and semantic structure.
2. Check the content with professionals working with DHH children. If necessary, make adaptations to the questionnaire, such as replacing inappropriate (parts of) items. Though, beware that these adaptations do not alter the intended meaning of the item. These adaptations should be carried through in the spoken/written language versions.
3. Have a qualified sign language interpreter translate the items to (standardized) sign language. Check the content, the suitability of test vocabulary and the

presence of regional sign alternatives with native signers (cf. Enns & Herman, 2011). If necessary, make adaptations to the questionnaire, but make sure these adaptations do not alter the intended meaning of the item. These adaptations should be made to the spoken/written language versions as well.

4. Videotape the items signed by a native signer. The so-called 'sign-space' should be visible. The background, but also clothing of the signer should have a discrete color.
5. Carry out back translation and verify convergence between the original and translated version. This 'back translator' should be unfamiliar with the questionnaire to avoid influence of existing knowledge.
6. Statistically establish measurement invariance, for example, through Differential Item Functioning analysis, multigroup Confirmatory Factor Analysis or Multidimensional scaling.
7. Develop a computer program in which the items can be presented one by one. Accordingly, both the written- and the signed versions of the items should be presented in similar fashion.

Conclusions and Discussion

Various methods can be used to explore the psychosocial functioning of DHH youth. In this overview, we outlined the considerations researchers should take when using self-reports as assessment tools. These considerations include language mode, translation from a spoken to a sign language, grammar, semantic content, and the manner in which questionnaires are presented.

We are aware that the resulting assessment tools lack firmly established psychometric properties or standard norms for DHH children (Knoors, 2006; Maller, 2003). Reliability (i.e., consistency in measurement) and validity (i.e., the questionnaire measures what it aims to measure) should be established. Little research on the validity of assessment accommodations used with DHH children is conducted thus far (e.g., Cawthon & Online Research Lab, 2006, 2008). To reach the requirements concerning reliability and validity, we believe the recommendations that have been outlined in the present article are a good starting point. Reliability of our adapted questionnaire for measuring depressive symptoms in the DHH sample was $\alpha = .75$, which is indicative of good internal consistency and comparable to the hearing sample ($\alpha = .73$) (Kouwenberg et al.,

2011). To address concurrent validity (i.e., demonstrate the accuracy of a questionnaire by comparing it with a questionnaire that has been proven valid), other standardized and valid questionnaires must be present. From a pilot study incorporated in our research, we found high associations between the original and adapted version of the depressive symptoms questionnaire ($r = .75, p < .001$; refer to Kouwenberg et al., 2011). This validation was in a hearing sample. To fulfill validity requirements within the DHH sample, research groups should validate and present questionnaires to large(r) samples of DHH children. This is a challenging task for one research group and therefore the exchange of questionnaires and their psychometric properties should occur between research groups. This way, standardized questionnaires and norms could be established for DHH children.

There is an unmet need for valid and reliable psychosocial assessment tools suitable for DHH children and adolescents. With the recommendations provided here, we hope to have made a large step in achieving this goal.





Chapter **3**

Somatic complaints in children and adolescents who are deaf or hard of hearing

Published as: Pathways underlying somatic complaints in children and
adolescents who are deaf or hard of hearing
Maartje Kouwenberg, Carolien Rieffe, Stephanie C.P.M. Theunissen,
& Paul Oosterveld

Journal of Deaf Studies and Deaf Education, 2011

Abstract

Frequent somatic complaints are not only a problem in themselves but also related to other difficulties. So far, no conclusive findings have been reported about the prevalence of and factors underlying these complaints in children and adolescents who are deaf or hard of hearing (DHH). Such information would be valuable for prevention and intervention. Therefore, the aim of this study was to examine the prevalence of somatic complaints and their relation with emotional functioning in DHH youngsters, as compared with hearing youngsters. This was established by assessing how somatic complaints, mood states, and sense of coherence were experienced by 186 Dutch participants (mean age = 11;07 years). DHH and hearing groups were compared using multivariate analysis of variance and structural equation modeling. The results showed that somatic complaints were reported equally often for both groups, but that the pathways leading to these complaints were partly different. Only in DHH participants were feelings of fear associated with more somatic complaints. The results suggest that DHH children and adolescents would benefit from support in the regulation of fear and its causes. Other aspects affecting adjustment outcomes of DHH youngsters were education type and communication mode.

Introduction

Despite the fact that many people who are deaf or hard of hearing (DHH) have no other physiological problems than this sensory loss, they run a higher risk of developing mental health problems than hearing people. Various internalizing problems, such as somatic complaints (e.g., headache, stomach ache, and dizziness), depression, or anxiety, are more often observed in DHH adolescents than in hearing adolescents (Fellinger, Holzinger, Sattel, Laucht, & Goldberg, 2009; Konuk, Erdogan, Atik, Ugur, & Simsekyilmaz, 2006; Van Eldik, 2005). It has been found that internalizing problems in hearing youth are predicted by emotional functioning (cf. Zeman, Shipman, & Suveg, 2002). In particular, problems in emotion regulation and dealing with daily stressors have been identified as important factors underlying the development of internalizing symptoms such as somatic complaints (Campo, Bridge, Ehmann, Altman, Lucas, Birmaher, & Brent, 2004; Jellesma, Rieffe, Meerum Terwogt, & Westenberg, 2011; Torsheim, Aaroe, & Wold, 2001).

Besides somatic complaints being a problem in themselves, they are also associated with increased social isolation and academic difficulties because these children frequently miss out on school and other school-related social activities (Campo, Jansen-McWilliams, Comer, & Kelleher, 1999; Torsheim et al., 2001). For DHH children, absence from school can be even more unfortunate because this group already is more likely to have to repeat a grade than hearing children (Bess, Dodd-Murphy, & Parker, 1998). The question now is whether the same factors that in hearing children and adolescents have been identified as contributing to the development of somatic complaints also apply to DHH children and adolescents. Therefore, the aim of our study was to examine the prevalence of somatic complaints and their associations with emotional functioning in DHH children and adolescents, as compared with hearing children and adolescents.

Emotional functioning in children who are DHH

In general, DHH children appear to have difficulties in the domain of emotional functioning (cf. Hosie, Russell, Gray, Scott, Hunter, Banks, & Macauley, 2000; Rieffe, 2012). These emotional difficulties could be associated with limited access to communicative exchanges, as more than 96% of DHH children grow up in hearing families (Mitchell & Karchmer, 2004). Communicative exchanges are an important factor in learning about emotions; hearing children whose

parents regularly discuss emotions with them have been found to demonstrate a more complex understanding of emotions than children whose parents do not regularly discuss emotions (cf. Denham, Renwick-DeBardi, & Hewes, 1994). In this respect, the key factor does not appear to be the modality of communication (sign, sign supported, or spoken) but rather whether DHH children share a similar communication mode with their parents (cf. Christiansen & Leigh, 2004; Wallis, Musselman, & MacKay, 2004). This is supported by the fact that regarding developmental timelines and milestones, deaf children born of deaf parents are on a par with hearing children born of hearing parents (cf. Courtin, 2000; Peterson & Siegal, 1995; Petitto, 2000). In addition to communicative exchanges between family members and the children themselves, overhearing others is also an important aspect of learning about emotions. DHH children cannot ‘accidentally overhear’ conversations of others, which affects the scope of daily learning opportunities about emotions and in turn could cause emotional difficulties.

For example, there are problems in the emotion regulation strategies of DHH children. It should be kept in mind that this implies to a subset of DHH children and not the full DHH population. Yet, a significant subset does experience emotion regulation difficulties; for example, these children analyze a situation less thoroughly than hearing children. DHH children acknowledge only one emotion when multiple emotions could be experienced (Rieffe, Meerum Terwogt, & Smit, 2003). Furthermore, their range of coping strategies is limited (Rieffe, 2012), and they relatively often neglect factors that can influence strategy effectiveness, such as the controllability of a situation (Rieffe et al., 2003). When a situation is not totally hopeless (i.e., more controllable), an anger response is usually strategically appropriate because anger is aimed at changing the situation for the better. This implies a healthy and constructive anger response, such as to express and explain the angry feelings in a controlled confrontational manner. Yet, in case of a less controllable situation, it is more productive to focus on the outcome of the negative situation instead of the cause and come to terms with the damage incurred. This coming to terms with the damage incurred is associated with a feeling of sadness (Stein & Trabasso, 1989). DHH children were found to report sadness more often than anger in daily stress situations, irrespective of the controllability of the situation (Rieffe et al., 2003). Their focus on the undesired negative outcome and the additional feelings of sadness could make them feel unable to influence situations for the better (Siemer, Mauss,

& Gross, 2007); in other words, it may make them feel they lack control in their daily lives.

Other studies found that when DHH children do express anger, they often express this in a maladaptive manner. DHH children expressed their anger more openly than hearing children (Hosie et al., 2000). Additionally, DHH children did not try to explain the anguish they felt to the children who were hurting them (Rieffe & Meerum Terwogt, 2006). Ineffective use of negative emotions (besides anger, this pertains also to other negative emotions) can result in less reduction of the intensity of the negative emotions; the negative emotions are prolonged, which can cause negative moods. Negative mood states, in turn, are aspects that have frequently been found to be associated with the experience of somatic complaints in typical development (Campo, Bridge, Ehmann, Altman, Lucas, Birmaher, & Brent 2004; Meerum Terwogt, Rieffe, Miers, Jellesma, & Tolland, 2006; Rieffe, Meerum Terwogt, & Bosch, 2004).

Emotional functioning and somatic complaints

The link between somatic complaints (e.g., headache, stomach ache, and dizziness) and various negative moods has been explained by the fact that emotions have a physiological component (Mayne, 1999). Emotional reactions evoke physiological changes, such as increased heart and breathing rates and muscle tension. These physiological changes are essential for the adaptive behavior that the emotion is intended to achieve. For example, in case of anger, the aim is to defeat the opponent or stop the opponent from causing further harm (Frijda, 1986). However, when an individual does not adequately react to a negative emotion-evoking situation (in a cognitive or behavioral manner), the emotion and its physiological component linger and long-term negative mood states arise (Scherer, 2000). These moods can intensify and prolong the bodily stress reactions, which in the long run can lead to somatic complaints (cf. Segerstrom & Miller, 2004).

Additionally, people's level of so-called 'sense of coherence' (SoC, i.e., how competent people feel in dealing with everyday stress situations) has been an important factor in explaining the development of somatic complaints (Jellesma, Rieffe, Meerum Terwogt, & Kneepkens, 2006; Torsheim et al., 2001). SoC refers to the affective appraisal component of daily life situations, that is, it reflects the extent to which children understand the meaning of life situations, make sense of them, and control them (Antonovsky, 1993). SoC differs from constructs

that bear conceptual resemblance, for instance internal locus of control, in that SoC is universally meaningful. Thus, the term does not refer to specific strategy types but to factors that always and in all cultures form the basis for successful dealing with daily stressors. Previous studies have found associations between SoC and health in typically developing children (Jellesma et al., 2011; Torsheim et al., 2001); we refer to those studies for more detailed information regarding the exact basis of this association. What is relevant in the current context is that children with a low sense of coherence have been found to report more somatic complaints whereas higher levels of situational control are associated with fewer somatic complaints.

To sum up, in typical development both negative affect and SoC have been found to be associated with somatic complaints. In DHH children, these emotional functioning variables are generally thought to be affected in comparison to hearing children, that is, higher levels of negative moods and lower levels of SoC. Can these forms of emotional functioning predict the high levels of somatic complaints reported for DHH children and adolescents?

Somatic complaints in children who are DHH

These high levels of somatic complaints in DHH children have been found in self-report studies (Kent, 2003; Van Eldik, 2005). Yet, when parents were the informants, the results were not conclusive; some studies found that DHH children experience more somatic complaints than hearing children (Konuk et al., 2006) whereas others failed to find this difference (Van Eldik, Treffers, Veerman, & Verhulst, 2004). Underdiagnosis of somatic complaints has also been found in research on hearing children when their parents were the informants (Meesters, Muris, Ghys, Reumerman, & Rooijmans, 2003). Underdiagnosis can be an even bigger issue in DHH children, due to communication barriers between them and their generally hearing parents (Connolly, 2006).

There is an aspect that should be specifically considered in research on the DHH group: the heterogeneity of this group. Heterogeneity can be found in, for example, degree of hearing loss, preferred mode of communication (sign, sign supported, or spoken), type of schooling, and type of hearing aids. With respect to school placement, most studies on the prevalence of somatic complaints include either children in special schools (Konuk et al., 2006; Van Eldik et al., 2004) or children in regular education (Kent, 2003). However, Van Eldik (2005) included both groups, and found that the children at special

schools for the deaf and hard of hearing score significantly higher on somatic complaints than children in regular education. Concerning heterogeneity in hearing aids, children who derive little or no benefit from conventional hearing aids nowadays receive cochlear implants (CI). The number of CIs in young children has increased rapidly over the past two decades, and the effect of this hearing device on psychosocial areas of adjustment is a controversial issue. Overall, the psychological (e.g., feeling good about oneself, feelings of loneliness, ability to control tension and anxiety) and social functioning (e.g., interaction with peers) of children with a CI is suggested to lie somewhere between that of children with regular hearing aids and hearing children, but results and conclusions vary considerably (Bat-Chava, Martin, & Kosciw, 2005; Dammeyer, 2010; Huber, 2005; Khan, Edwards, & Langdon, 2005). Regarding the influence of the type of hearing aid on specific somatic complaints, no known studies have been carried out thus far. Additionally, no known studies have been conducted on the association between mode of communication and somatic complaints. Mode of communication has been studied with respect to its association with psychopathology in general, a connection that has been supported by some studies (Van Gent, Goedhart, Hindley, & Treffers, 2007; Vostanis, 1997) but not in others (Hindley, Hill, McGuigan, & Kitson, 1994; Polat, 2003). Other studies support the notion that it is not communication mode as such, but a match in communication between children and their social surroundings that affects mental health (cf. Wallis et al., 2004). However, because it is still unclear whether the use of sign or sign supported language, or spoken language is associated with variability in psychological outcomes, communication mode is a variable that should not be neglected in psychological research on DHH children.

Purpose of study

To date, conclusive knowledge about the occurrence of somatic complaints and the factors underlying these in DHH children and adolescents is scarce. The aim of our study was twofold. The first was to examine whether DHH children and adolescents experience more somatic complaints than hearing children and adolescents. Most studies on internalizing symptoms in DHH children are based on parent-reports, whereas it could be argued that because of the possible communication difficulties between these children and their hearing parents, the best sources of information are the children themselves. Therefore, our study is based on children's self-reports about their somatic complaints. On the basis of past research findings

on children's self-reports (Kent, 2003; Van Eldik, 2005), we predicted that DHH participants would report more somatic complaints than hearing participants. Additionally, the differences in prevalence between subsamples of the group of DHH participants (CI vs. regular hearing aids, mainstream vs. special education, and sign or sign supported vs. spoken communication) were explored. Given not only the small body of literature but also conflicting results, no specific predictions could be formulated with respect to differences between the subsamples based on type of hearing aid or communication mode. However, concerning education type, we expected children and adolescents in special education to report more somatic complaints than mainstreamed children and adolescents, in line with past results of Van Eldik (2005).

The second aim of this study was to examine two aspects of emotional functioning that could be important for understanding the development of somatic complaints in DHH children and adolescents. Affective mood state and feelings of control over daily situations are related to somatic complaints in hearing youngsters. In this study, we examined the extent to which these relations also apply to DHH youngsters and hence focused on the moderating effect of group membership (i.e., DHH vs. hearing) on the relations between affective mood state and SoC on the one hand and somatic complaints on the other. These relations were established through regression analyzes. The analysis framework chosen here was multigroup structural equation modeling (SEM), as this allows statistical testing of the differences of regression parameters between groups (Bollen, 1989). Although we expected DHH participants to have a reduced SoC and elevated levels of negative mood states, there is no clear reason to expect the relations between these predictor variables and somatic complaints to be different in DHH children and adolescents than in hearing populations. The theory that problems in the emotional domain are associated with somatic complaints should also account for complaints reported for DHH children and adolescents; however, there is no clear empirical evidence for this, and that is what we tried to find by our experiment.

Method

The topic of this article is part of a larger research project in which multiple aspects of the social and emotional development of DHH children and adolescents are

explored. The Medical Ethics Committee of the Leiden University Medical Center granted permission for the research.

Participants

A total of 186 children and adolescents participated in the study, of which 73 were DHH participants. Inclusion criteria for the DHH participants were (a) significant hearing losses in both ears of at least 40 dB in the best ear, which were calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz; (b) detected with hearing loss prelingually or perilingually; and (c) to not have any medical or developmental disabilities such as mental retardation or autism spectrum disorder. All children were born into hearing families, except for one child, whose parents both were deaf.

A control group of hearing children and adolescents were recruited from primary and secondary regular schools in the Netherlands. These schools were randomly selected, although it was ensured that these schools were a proper reflection of the Dutch educational system. Schools that agreed upon participation sent information packages to the parents, who in turn sent a signed consent form to the research group. Exclusion criteria for the control group were identical to the DHH group (i.e., no diagnosed disabilities). The control group matched with the DHH children regarding age, socioeconomic status (measured by net income per year, job, and highest education of both parents), ethnicity, and two subtests to measure nonverbal intelligence. Table 1 provides specific details about both groups. This information was obtained from both parental questionnaires and medical records.

Materials

The questionnaires used in the present study were self-reports and addressed somatic complaints, mood (sadness, fear, anger, and happiness), and sense of coherence. All participants viewed the items one at a time in written Dutch on a laptop. Beneath each item were three response buttons on which the participants could click with a computer mouse. After an answer was given, the next item appeared automatically. DHH participants proficient in sign or sign supported language watched a short movie with a sign language version of the item, in addition to the written Dutch version. These short sign language movies could be replayed as many times as the participant desired. A qualified sign language interpreter did translation from Dutch into sign language. Subsequently, the

items were videotaped, signed by either a deaf individual or a sign language interpreter. Back translation did not show discrepancy between translated and original items.

Table 1 *Characteristics of (subsamples of) participants*

	Total sample (N = 186)	
	DHH	Hearing
Number of children - <i>n</i>	73	113
Age mean in years (<i>SD</i>)	12;01 (1;08)	11;08 (1;04)
Age range in years	9;05-15;08	9;01-14;08
Sex - <i>n</i> (%)		
Male	37 (51%)	50 (45%)
Female	36 (49%)	63 (55%)
Degree of hearing loss ^a - <i>n</i> (%)		
Moderate (40-60 dB)	20 (27.5%)	
Severe (61-90 dB)	19 (26%)	
Profound (91-120 dB)	25 (34%)	
Unknown	9 (12.5%)	
Preferred mode of communication - <i>n</i> (%)		
Oral language only	49 (67%)	
Sign supported Dutch	22 (30%)	
Sign language	2 (3%)	
Type of education - <i>n</i> (%)		
Regular education	43 (59%)	
Special education	30 (41%)	
Type of amplification - <i>n</i> (%)		
Hearing aid (of which 1 BAHA ^b)	48 (66%)	
Cochlear Implant	25 (34%)	

^a Degree of hearing loss was calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz.

^b BAHA = Bone Anchored Hearing Aid.

Before actual data collection began, participants were assured that their responses would be processed anonymously. In addition, they were informed that clarifications on any item or question could be asked of the researcher. Subsequently, they were made familiar with the testing procedure by an introduction and sample questions.

The *Somatic Complaint List* (SCL; Jellesma, Rieffe, & Meerum Terwogt, 2007; Rieffe et al., 2004) consists of 11 items. This list was developed in order to identify how often children and adolescents experience various forms of pain and other bodily complaints, such as dizziness, stomach ache, and headache. Children rate the frequency with which they experience these complaints on a 3-point scale

(1 = *never*, 2 = *sometimes*, and 3 = *often*). Two of the items are positively formulated and thus reversely scored.

The *Mood Questionnaire* (Rieffe et al., 2004) comprises four mood scales (three negative: anger, sadness, and fear; one positive: happiness). These four scales contain a total of 17 items (anger, sadness, and fear: four items each; happiness: five items), which were expanded by three additional positive filler items to compensate for the overrepresentation of negative items. Children are asked “How have you been feeling the past four weeks?” as an introduction to the items and instructed to score each item on a 3-point scale (1 = [*almost*] *never*, 2 = *sometimes*, and 3 = *often*). Example items are “I feel afraid” (fear scale), “I am furious” (anger scale), “I feel sad” (sadness scale), and “I feel happy” (happiness scale).

Sense of Coherence refers to an individual's view of the world as meaningful and predictable. The original version of this scale consists of 13 items (Antonovsky, 1993; translated by Torsheim et al., 2001). In the present study an adapted and shortened version of six items was used to make data collection less demanding for participants. Based on a pilot study with 474 children and adolescents, these six items were found to be core items that strongly represent sense of coherence. The external validity of the shortened version was checked, and comparisons were made between correlations of the full questionnaire and the shortened questionnaire with related measures, such as depression, anxiety, and self-esteem (Eriksson & Lindström, 2005). Both the full and the shortened versions were significantly correlated with these measures, with similar correlation coefficients (i.e., $r = 2.29$ vs. $r = 2.30$, $r = 2.60$ vs. $r = 2.60$, and $r = .34$ vs. $r = .30$ for depression, social anxiety, and self-esteem, respectively). The reliability coefficient of the shortened version in the pilot was $\alpha = .74$. Internal consistency depends on number of participants in the sample and number of items per scale (Nunnally, 1978), which explains the lower albeit still adequate internal consistency of our shorter scale in the current study. Adaptations were made in formulations and/or length of the items in order to make them more comprehensible for DHH children given their possible language difficulties. For example, the item “How often do you have feelings that you are not sure you can keep under control?” was adapted into “I cannot keep my feelings under control.” The participants were asked to score the items on a 3-point scale (1 = *never*, 2 = *sometimes*, and 3 = *often*).

The *nonverbal intelligence* of the children was assessed with two subtests of the Wechsler intelligence scale for children-Third Edition (WISC-III): Block

Design (copying small geometric designs with cubes) and Picture Arrangement (sequencing pictures to make logical stories; Kort, Schittekatte, Compaan, Bosmans, Bleichrodt, Vermeir, & Verhaeghe, 2002; Wechsler, 1991). For seven DHH and 15 hearing children, there were missing data on both IQ subtests. All questionnaires had internal consistencies ranging from sufficient to good, as shown in Table 2. In addition, internal consistencies of the sign language versions and spoken language versions were also calculated separately. These were found to be sufficient to good, taken into account the small samples and few items per scale, except for the Fear mood due to its low incidence (Nunnally, 1978).

Table 2 *Psychometric properties of questionnaires*

	No. of items	Range	Alpha		Means (SD)	
			DHH	H	DHH	H
Somatic complaints	11	1-3	.82	.83	1.42 (.35)	1.48 (.35)
Mood						
Sadness	4	1-3	.77	.82	1.41 (.46)	1.36 (.39)
Fear	4	1-3	.69	.80	1.31 (.43)	1.29 (.37)
Anger	4	1-3	.83	.79	1.41 (.43)	1.40 (.39)
Happiness	5	1-3	.76	.85	2.83 (.31)	2.74 (.35)
Sense of Coherence	6	1-3	.70	.65	2.29 (.37)	2.24 (.36)

Abbreviations. DHH = deaf or hard of hearing; H = hearing

Procedure

In total, 27 schools for the deaf and hard of hearing and four ambulatory care organizations (that is, health care services that are provided on an outpatient basis) for DHH children and their families were asked to participate in the present study. Twelve schools refused to participate for several reasons (e.g., not only a lack of children who met the criteria for the sample but also concerns about the potential time commitment for both the school and children and ongoing research projects). Two schools and one ambulant care organization did not respond at all, but 13 schools and three organizations agreed to participate in the study. These special schools were not mainstream programs that included both DHH and typically developing hearing students. Furthermore, these schools had a bilingual teaching philosophy in which students were educated in spoken language supported by sign and sign language. In line with privacy policy, information packages and consent forms were sent to the parent(s) of the children via these schools and organizations. Following receipt of completed

and signed consent forms, the schools or parents were contacted to set a date for data collection.

Participants (both DHH and hearing) were individually tested at school or at home in two sessions ranging from 30 min to 1 hr, with approximately one week in between. The researchers communicated with the participants in their preferred mode of communication.

Statistical Analyzes

For the comparison of DHH youngsters and hearing youngsters on the prevalence of somatic complaints, the levels of the four affective mood states (fear, happiness, anger, and sadness), and sense of coherence, a multivariate analysis of variance (MANOVA) was carried out. In addition, a MANOVA was conducted to compare the three subgroups of DHH children and adolescents (i.e., CI vs. regular hearing aids, sign or sign supported language vs. spoken language, and regular vs. special education) on the aspects of emotional functioning. In this latter analysis, the three main effects (i.e., hearing device, language mode, and education type) were explored, when there was a correction for the remaining two main effects. Version 19.0 of the *Statistical Packages for the Social Sciences program* (SPSS) was used.

The relations between the emotional functioning variables and somatic complaints were established by means of regression analyzes, in which somatic complaints was the dependent variable and aspects of emotional functioning were the independent variables. As important as the strength of the relations are the differences in these relations between the two groups. These possible group differences were tested by means of SEM, part of the statistical software package of LISREL (Jöreskog & Van Thillo, 1972). In this approach, first a model is tested with equality restrictions on all regression parameters of the two groups, that is, the matrices of regression parameters contain exactly the same values for the two groups. Model fit can be evaluated by means of the chi-square test and several fit indices such as the root means square error of approximation (RMSEA). If the test statistic reaches significance, the null hypothesis of equal regression parameters must be rejected. If this model fit is rejected, univariate tests of specific parameter in variance (the so-called modification indices) can be used to identify the group differences in regression weights. If the two sets of regression parameters are indeed found to differ, group membership has a moderating effect on the relation between the variables (Bollen, 1989).

Results

DHH vs. hearing participants on somatic complaints, affective mood states, and SoC

The first research question entailed establishing whether DHH children and adolescents have a higher prevalence of Somatic Complaints in comparison to a sample of hearing children and adolescents. Overall the group of DHH participants did not report a higher prevalence of Somatic Complaints than hearing participants, $M = 1.49$, $SD = 0.36$ vs. $M = 1.42$, $SD = 0.35$; $F(1,184) = 1.80$, $p = .18$. Furthermore, no group differences were found on any of the four affective mood states or sense of coherence.

However, differences between the DHH and hearing group are found in correlations between the four affective mood states. In Table 3, it can be seen that Happiness and Fear, and Happiness and Sadness are unrelated in the DHH group.

Table 3 *Correlations between mood scales for the DHH and hearing groups separately*

	Sadness	Fear	Anger	Happiness
Sadness		.58***	.50***	-.23
Fear	.57***		.34**	-.03
Anger	.22*	.23*		-.34**
Happiness	-.52***	-.46***	-.28**	

Note. Above the diagonal the DHH group and below the hearing group

* $p < .05$, ** $p < .01$, *** $p < .001$

Differences between subgroups of DHH participants

In-depth analysis of the group of DHH children and adolescents revealed that participants using Sign or sign supported language reported higher levels of Fear mood in comparison to participants using only Spoken language, $M = 1.49$, $SD = 0.52$ versus $M = 1.20$, $SD = 0.24$; $F(1,69) = 8.79$, $p < .01$; partial $\eta^2 = .113$. In addition, students in Special education report less Happiness mood than students attending Mainstream education, $M = 2.63$, $SD = 0.39$ versus $M = 2.84$, $SD = 0.27$; $F(1,69) = 4.78$, $p < .05$; partial $\eta^2 = .065$. These differences could not be explained by variability in degree of hearing loss, as this variable was not found to be related to any of the variables. No other differences between subgroups of DHH participants have been found on the variables examined in the current study.

Table 4 *Correlations and regression coefficients*

Variables	DHH	Hearing	Total sample		DHH	Hearing
	Pearson		R^2_{adj}	B	R^2_{adj}	B
	Correlations					
			49%		51%	
Age				.02		
Gender				.07		
Mood						
Sadness	.49***	.67***		.23***		
Fear	.50***	.50***		.10	.21**	.01
Anger	.40***	.34***		.10*		
Happiness	-.34**	-.66***		-.28***	-.19*	-.43***
SoC	-.49***	-.38***		-.17**		

Abbreviation. SoC = Sense of Coherence

* $p < .05$, ** $p < .01$, *** $p < .001$

Emotional functioning predicting somatic complaints

The second research question entailed establishing which emotional functioning variables are associated with and predicted the prevalence of Somatic Complaints. The Pearson correlation analyzes (see Table 4) revealed that all negative moods (i.e., Fear, Sadness, and Anger) were positively associated with Somatic Complaints. In contrast, the positive mood Happiness was negatively associated with Somatic Complaints. Sense of Coherence (SoC) was found to be negatively linked to Somatic Complaints. No major differences between DHH participants and hearing participants on these correlations were found. In addition, correlational analyzes between Age and all variables were conducted for the DHH and hearing groups separately. No significant relations were found. Yet, group differences were found after carrying out the multigroup analysis in which the regression model of Somatic Complaints on the four affective Mood scales and SoC was fitted with equality constraints on all parameters. The chi-square reached significance ($\chi^2 = 72.43$, degree of freedom = 36, $p < .001$), and also other measures showed poor fit (RMSEA = 0.11; Goodness of Fit Index = .89) suggesting inequality. The rejection of the null hypothesis and the poor values of the fit measures indicate that there are differences in the parameters between the two groups. The largest decrease in chi-square value could be accomplished (as determined from the modification indices) by removing the equality restrictions in the regression of Somatic Complaints on Fear mood and Happiness mood. When these equality restrictions were removed, the regression coefficients indicated a stronger negative contribution of Happiness mood on Somatic

Complaints in the hearing group than in the DHH group. In addition, Fear mood only contributes positively to Somatic Complaints in the DHH group, whereas this does not contribute to Somatic Complaints in the hearing group. Concerning contribution of feelings of control on Somatic Complaints, no group differences were found between DHH participants and hearing participants. Finally, Age and Gender were not found to make a significant contribution to somatic complaints.

Discussion

In this study, we explored the occurrences of and factors underlying somatic complaints in (subsamples of) a group of children and adolescents who are DHH. Regarding the prevalence of somatic complaints in DHH youngsters as compared with hearing youngsters, previous findings of more self-reported somatic complaints in DHH than in hearing populations (Kent, 2003; Van Eldik, 2005) could not be confirmed. This discrepancy could have to do with the methodology used to assess somatic complaints. In our study, we used a well-validated questionnaire to examine exclusively the experience of somatic complaints (SCL; Jellesma et al., 2007). In previous studies, assessment of somatic complaints was part of larger questionnaires assessing health behavior or child behavior in general, such as the Health Behavior in School-aged Children questionnaire (Kent, 2003) or the Youth Self-Report (Van Eldik, 2005). In addition, these questionnaires had larger reference periods than the four weeks of the SCL, covering two months (Youth Self-Report) or even six months (Health Behavior in School-aged Children questionnaire). In general, the more complex the recall task, the less reliable the reporting (Brener, Billy, & Grady, 2003). Finally, we found dissimilarities between these somatic complaints scales and the questionnaire used in our study regarding the particular physical complaints that were assessed. To find out whether certain physical complaints are experienced especially by DHH children and in turn cause differences between DHH and hearing children, future research should assess somatic complaints by using a one-dimensional questionnaire including a variety of physical complaints.

When we considered the subsamples of DHH participants, it appeared that children and adolescents using sign or sign supported language reported more fear than children and adolescents using spoken language. It should be mentioned here that the group using sign or sign supported language included

only two children who used sign language. So, these results pertain particularly to children using sign supported language, and caution should be taken in generalizing to native speakers of sign language. In addition, results showed that students in special education reported less happiness than students in regular schools. The findings for these groups defined by education type and language mode are obviously interrelated because only 3 out of 43 individuals in mainstream schools used sign supported language, compared with 22 out of 30 individuals in the special schools who did so. One might be tempted to conclude that special schools and sign supported language hamper DHH youngsters in their development. However, it should be noted that students attending mainstream schools are those that do very well given their hearing loss (Van Gent et al., 2007) and are expected by professionals to be able to fit in and perform well academically and socially. In contrast, children with various problems could increasingly populate special education schools. It is not the education type that appears to be the essential factor but rather the special characteristics of the students attending a certain form of education.

Besides analyzing subsamples based on education type and language mode, we also explored differences between children and adolescents with CI and with regular hearing aids. What benefits children may derive from their CI is an especially controversial topic nowadays, and thus far the results on psychosocial functioning have not been unequivocal. Our results indicate that youngsters who received a CI did not differ from youngsters with regular hearing aids (or the hearing youngsters) regarding the prevalence of somatic complaints nor any of the other variables. It is important to note that the group of children and adolescents with CI that took part in the present study was relatively small, with 25 participants; more firm conclusions could be drawn on a larger sample.

Contrary to expectation, sense of coherence was the same for DHH and hearing youngsters and for the various DHH subsamples. On the basis of previous work, in which deaf children had been found to take less notice of causal factors leading to a negative event but instead stayed focused on the desired outcome (Meerum Terwogt & Rieffe, 2004), we had expected DHH children to feel less in control over situations. However, this was not confirmed in our sample. It is possible that DHH children use different strategies than hearing children to communicate and negotiate within their social environment. Perhaps, DHH children's tendency to focus excessively on the desired outcome (Rieffe & Meerum Terwogt, 2000) is not the result of ignorance regarding causal

factors in the situation but a deliberate strategy that works best in a hearing environment with which they share limited means of communication. This alternative explanation is supported by a recent study in which deaf children have shown that they understand the difference between situations for which someone could be held responsible, and situations in which this was not the case (Rieffe, 2012). Future studies could look into this issue more closely because of its relevance for professionals working with DHH individuals.

Our second main question related to the extent to which mood states and sense of coherence were associated with somatic complaints and to what extent group membership (DHH or hearing) would moderate these relations. For both groups, all variables correlated in the expected directions: negative mood states correlated positively with somatic complaints, and this was reversed for happiness and sense of coherence. Moreover, sadness, anger, and happiness, and the participants' sense of coherence predicted somatic complaints, and the explained variance of this model was high. These significant contributions confirmed our expectations and were consistent with the literature (Jellesma et al., 2006, 2011; Rieffe, 2012; Torsheim et al., 2001).

In contrast, our finding that feelings of fear did not uniquely contribute to the prediction of somatic complaints was unexpected and inconsistent with the literature (Jellesma et al., 2006), despite its high correlation with somatic complaints in both groups. Fear was measured by asking children how frequently within the past four weeks they had, for instance, been afraid or experienced a situation as scary. The exact role played by feelings of fear was clarified by examining the moderating effect of group in the regression model. Outcome measures showed that, despite the high correlation between fear and somatic complaints, fear did not uniquely contribute to the prediction of somatic complaints for hearing children and adolescents. Yet, in DHH children and adolescents, fear did uniquely contribute to such a prediction, over and above the other mood states and sense of coherence. In contrast, the contribution of feelings of happiness was much stronger in the hearing group than in the DHH group.

These differences between the groups make sense when the bivariate correlations are considered. Even though in both groups the correlations between fear and somatic complaints were high in absolute terms (.50), it was high for the DHH group only in relation to correlations between the other mood states and somatic complaints. In the hearing group, however, the correlations among sadness, happiness, and somatic complaints (.67 and -.66, respectively) were very high

and took so much variance, there could be no unique contribution of fear. In addition, the relations between the mood states themselves show that in the hearing group more happiness is related to less sadness and less fear, whereas these significant interrelations are not found in the DHH group. This indicates that in hearing children, more happiness goes hand in hand with less sadness and less fear. In the DHH group, happiness and fear are less entangled, so that each has a unique contribution to somatic complaints. These relations not only between mood and somatic complaints but also between the mood states themselves explain the more dominant role of fear and the less dominant role of happiness in the regression model for the DHH group as opposed to that of the hearing group. In other words, in the development of somatic complaints, fear might play a more influential role for DHH children than for hearing children, whereas happiness might be a stronger protective factor for hearing than for DHH children. Yet, happiness is still a protective factor in the DHH group, and the association between happiness and somatic complaints in both the DHH and the hearing group corresponds to the findings reported in past literature (Jellesma et al., 2006). The mean scores on the variables showed no differences between the groups, but note that the relations underlying these variables and predicting somatic complaints do differ.

The fact that in the DHH group fear is closely related to somatic complaints may mean that this emotion is especially difficult for DHH children and adolescents to deal with. We can only speculate as to the cause of this difficulty. Perhaps, DHH children and adolescents experience feelings of fear due to the fact that they are living in a hearing society to which they have to make adjustments (e.g., regarding interaction) that can generate feelings of fear (Li & Prevat, 2010). Alternatively, one could argue that DHH children and adolescents could have fears that they do not want to share with others, possibly out of shame or perhaps because they do not want to be different from their hearing peers. These possible explanations should be addressed in a follow-up study.

Additionally, a follow-up study could have a longitudinal design, in order to confirm the assumptions about causality we made here. Furthermore, even though sample sizes were respectable, especially regarding the DHH group, the DHH sample size in our study was unfortunately still too small to compare the different subgroups with respect to the regression models. In future studies, this comparison could be realized by having larger subsamples. It is especially important to have more native speakers of sign language, as these

are a significant group within the DHH population. Additionally, in future studies, the influence of various characteristics of the DHH group on emotional development could be taken into account more explicitly, such as sense of Deaf identity, degree of specialist support received by DHH children in mainstream education, or decision of educational provision. Another aspect that could be examined further is which specific features of communication are associated with the emotional difficulties DHH children experience. Some previous results point to a lack in conversational depth or detail (Lederberg & Everhart, 2000; Preisler, Tvingstedt, & Ahlström, 2002). Yet, the question whether this is indeed associated with emotional difficulties needs to be clarified in future research.

A strength of our study was the sufficient to good psychometric properties of the questionnaires used. This is especially remarkable when we take into account the relatively small number of participants and items, and the fact that not only some adaptations were made but also translations into sign language for part of the DHH sample. The only exception was that fear feelings assessed from the DHH children who use the spoken language mode showed low reliability. More in-depth analyzes revealed a floor effect in the boy's sample within this group. Boys are often found to report absence of fear (Rieffe, Meerum Terwogt, & Kotronopoulou, 2007), which could be explained by the social prejudice that boys should be unafraid.

Finally, we would like to briefly discuss the findings of this study in the light of practical relevance, that is, its possible contribution to the prevention of somatic complaints and the adjustment of existing intervention programs. Intervention programs for DHH children and adolescents who are experiencing somatic complaints should focus on their feelings of fear, establishing the sources of their fears and finding out what would be the best approach in terms of support to reduce these feelings. To conclude, merely comparing DHH and hearing youngsters on outcome variables may not give full insight into group differences regarding psychological functioning because the pathways leading to the outcome variables may differ.





Chapter **4**

Self-reported symptoms of depression in children and adolescents who are deaf or hard of hearing

Published as: Intrapersonal and interpersonal factors related to self-reported symptoms of depression in DHH youth
Maartje Kouwenberg, Carolien Rieffe, & Stephanie C.P.M. Theunissen*

International Journal of Mental Health and Deafness, 2011

* The authors contributed equally to this article

Abstract

Depression is a common form of childhood psychopathology in hearing as well as deaf or hard of hearing (DHH) children. In this study we examined i) the prevalence of self-reported symptoms of depression in DHH and hearing participants, and ii) the extent to which factors related to these levels of depression were comparable in both groups. A total of 208 children and adolescents (78 DHH and 130 hearing) participated in the study with a mean age of 11 years. Participants were given questionnaires about depression, intrapersonal functioning (emotion awareness, self-esteem) and interpersonal functioning (victimization from peer-bullying, delinquency, and Theory of Mind (ToM)). The outcomes showed higher levels of self-reported depression in the DHH than in the hearing sample. Additionally, in both groups the indices for intrapersonal functioning and victimization were associated with levels of depression using a hierarchical regression model. Socially maladaptive behaviors (delinquency) were unrelated to depression in DHH participants; conversely, ToM was a significant factor for the DHH group only. This outcome emphasizes that the frequently noted problems of DHH youth regarding social understanding also affect other areas of their functioning during adolescence, such as mental health.

4 Introduction

The fact that deaf or hard of hearing (DHH) children and adolescents report or display more internalizing symptoms than hearing children has been well-documented (Theunissen, Rieffe, Kouwenberg, Soede, Briare, & Frijns, 2011; Van Gent, Goedhart, Hindley, & Treffers, 2007; Vostanis, 1997). It is especially depression, one of the most common forms of psychopathology in hearing children, which has been frequently reported in DHH youth (Fellinger, Holzinger, Sattel, & Laucht, 2008). Little is known, however, about factors that may contribute to the development of these internalizing symptoms in DHH children and, more importantly, to what extent possible patterns are similar to those in hearing peers or uniquely related to DHH children's hearing status. In this study, we examined the extent to which intrapersonal and interpersonal factors were uniquely related to self-reported symptoms of depression in DHH children and young adolescents as compared to their hearing peers.

Depression in childhood and adolescence

On the basis of the official DSM-IV criteria the prevalence of a childhood depressive disorder ranges from 0.4% to 8.3% in hearing children and adolescents (Birmaher et al., 1996; Lewinsohn, Clarke, Seeley, & Rohde, 1994). Note, however, that childhood depression is often underdiagnosed because internalizing symptoms are not necessarily observable (Keller, Lavori, Beardslee, Wunder, & Ryan, 1991; Preiss & Remschmidt, 2007). Additionally, internalizing symptoms are best known to the respondent, rather than other informants such as parents or teachers (DiBartolo & Grills, 2006). Depressive disorders in DHH children and adolescents might be even more underdiagnosed due to a lack of appropriate assessment tools and to communication problems (Connolly, 2006).

The diagnosis of clinical childhood depression is based on a medical approach, which dichotomously divides a population into 'ill' or 'not ill'. Alternatively, when symptoms of depression are measured, the disorder is perceived dimensionally. Consequently, a community population can be examined on the severity of these symptoms. Furthermore, the relation of individual differences to other variables can be examined, which can shed new light on the development of these symptoms.

Intrapersonal factors related to depression

The etiology of internalizing symptoms in hearing children is most frequently looked for in poor psychological functioning. Various theoretical models, backed up by cross-sectional or longitudinal designs, emphasize the extent to which intrapersonal problems such as problems in the emotion identification, maladaptive emotion regulation skills, or lower self-esteem, are causing increased levels of depression (Kashdan, Barrios, Forsyth, & Steger, 2006; Kim & Cicchetti, 2009; Ladouceur, Dahl, Williamson, Birmaher, Ryan, & Casey, 2005; Rieffe & De Rooij, 2011). Psychological functioning in DHH children during their early teens has been investigated only rarely. The few studies that did examine this aspect consistently show a basic emotion understanding, but also certain impairments in DHH children compared to their hearing peers.

DHH children's emotion vocabulary and their understanding of emotion elicitors seem age-appropriate as long as they are presented with the basic emotions such as happiness, anger and sadness (Rieffe & Meerum Terwogt, 2000). Yet, when the demands are higher, for example when they are asked to identify multiple emotions, DHH children fall behind their hearing peers, which suggests a more general and less differentiated emotion understanding (Rieffe, 2012; Rieffe, Meerum Terwogt, & Smit, 2003). Additionally, DHH children report a lower self-esteem (Bat-Chava, 1993), which reflects a negative self-evaluation or feeling of self-worth. A recent study by Van Gent and colleagues (2011) has shown that a lower self-esteem is associated with higher scores on mood disorders in DHH children, a pattern consistent with that in hearing children (Kim & Cicchetti, 2009; Van Gent, Goedhart, & Treffers, 2011).

Interpersonal factors related to depression

Alternatively, social constructivists have committed to another theoretical framework, in which social maladaptation is a key factor in the development of internalizing symptoms such as depression. In this view, it is social experiences combined with the individual's active participation that are shaping the individual's development (Pritchard & Woollard, 2010). Longitudinal studies do indeed support this theoretical model for hearing adolescents. For example, poor friendship quality and victimization contribute to the prediction of depression in hearing children and adolescents (Boney McCoy & Finkelhor, 1996; Selfhout, Branje, & Meeus, 2009). Since DHH children are especially known for their social problems, their interpersonal functioning might be an even stronger candidate

than their intrapersonal functioning when it comes to explaining depressive symptoms in this particular group.

Like hearing children, DHH children are victims of bullying by their peers. In some studies they report higher levels of victimization than their hearing peers (Fellinger et al., 2008), but this has not been found in others (Bauman & Pero, 2005). Regardless of a possible difference in absolute levels of victimization between hearing and DHH participants, a more important result was the finding by Fellinger and colleagues (2008) that DHH children with a mean age of eleven years who were teased or maltreated by their peers, showed more symptoms of internalizing problems.

Besides being victims, DHH children also show more externalizing behavioral problems (Coll, Cutler, Thobro, Haas, & Powell, 2009; Dammeyer, 2010), independently of their level of deafness (Fellinger et al., 2008). Maladaptive social behaviors such as delinquency are strongly correlated to depressive symptoms in hearing children and adolescents (Miller, Malone, & Dodge, 2010; Ritakallio, Kaltiala-Heino, Kivivuori, & Rimpelä, 2005). However, it could be argued that DHH children's oppositional behaviors are a reaction to their limited access to the social, hearing world around them, which causes them to misunderstand people's actions and emotions (Meerum Terwogt & Rieffe, 2004). The many studies using different kinds of Theory of Mind (ToM) tasks consistently illustrate this impairment in DHH children compared to their hearing peers (cf. Peterson & Wellman, 2009). These well-known ToM problems may strongly affect the development of depressive symptoms in DHH children and adolescents.

This study and its aims

Our study is a first attempt to examine the extent to which interpersonal and intrapersonal factors are uniquely related to self-reported symptoms of depression in hearing and DHH children and young adolescents. More specifically, we first examined associations between the interpersonal factors and depressive symptoms, and then explored the contribution of intrapersonal factors over and above the interpersonal factors. Indices for interpersonal functioning in this study are ToM, delinquency and victimization. Indices for intrapersonal functioning are emotion awareness (which refers to the ability to identify, value and communicate one's own emotions; Rieffe, Meerum Terwogt, & Petrides, 2007) and self-esteem. The data were collected cross-sectional, which avoids drawing conclusions concerning causality. Nevertheless, this method

offered the possibility to test our assumptions about the possible relationships between depressive symptoms and interpersonal and intrapersonal functioning in DHH and hearing children.

We expected interpersonal indices to be strongly associated with symptoms of depression in both groups. However, ToM was expected to be particularly relevant in the DHH group, because this mind-reading capacity is a major hurdle for many DHH children, and negatively affects their daily social functioning even during adolescence (Meerum Terwogt & Rieffe, 2004). For the hearing group it could be argued that intrapersonal factors such as emotion awareness and self-esteem will mediate the relation between interpersonal factors and depression, because in hearing children these two areas of functioning are closely related (Mavroveli, Petrides, Rieffe, & Bakker, 2010). In fact, high levels of emotion awareness and self-esteem are assumed to form the proper basis for children to develop good social relationships and behave in a socially adaptive way. This triangle of associations is expected to be less evident in DHH children. Because it is suggested in the literature that some of the social problems in DHH youth seem directly linked to their hearing loss, we expected interpersonal and intrapersonal factors to contribute more uniquely, more independently of each other, to the prediction of depressive symptoms in DHH children.

The age range of the participants in this study varies between eight and sixteen years, with a mean age of eleven. This age range was chosen because around the age of eight, children become increasingly aware of their own functioning and have an increased ability to reflect upon their own emotions and behaviors (Harris, 1989). The level of hearing loss and verbal ability was also taken into account. On the basis of previous studies we did not expect the level of hearing loss to affect the outcomes (Fellinger et al., 2008; Van Eldik, Treffers, Veerman, & Verhulst, 2004). Children's verbal level was expected to influence level of depression, with better language skills resulting in fewer internalizing problems (Moeller, 2007).

Method

Participants

In total 212 children participated in this study, of which 78 were DHH and 130 hearing. Four children (two DHH and two hearing) did not complete all

questionnaires and had been excluded from further analyzes. Children living in the Netherlands or in the Dutch speaking part of Belgium were included. The exclusion criterion was having any (other) medical or developmental disability, like mental retardation or speech motor problems. The Medical Ethics Committee of the Leiden University Medical Center granted permission for the study.

The inclusion criteria for the DHH group were having significant hearing losses of at least 40 dB in the best ear that were detected pre- or perilingually. The residual hearing was calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz. Medical records as well as parental questionnaires provided information on characteristics and performance measures. All DHH children were born into hearing families, except for one child, whose parents were both deaf. The children were in schools that promoted the development of auditory and oral skills, with or without the use of signs. None of the participants had received a clinical diagnosis for depression.

No significant age, gender, and socioeconomic status (measured by net income, job, and highest education of both parents) differences were found between the DHH and the hearing group. In addition, the DHH and hearing groups were compatible concerning their IQ normscores and language performances. Table 1 shows descriptive statistics.

Procedure

The DHH children were recruited from Speech and Hearing centers, hospitals, primary and secondary schools (special schools and mainstream schools) and via specific magazines and websites for DHH people. In order to reach the complete spectrum of DHH children and to reduce any possible selection bias, we approached as many as possible different organizations and schools. The hearing controls were recruited from primary and secondary mainstream schools.

Parental consent was obtained for all children. Participation of the study was voluntary. Participants were informed that all data would be analyzed anonymously and that they could withdraw at any moment without any explanation. The experimenter tested participants at school or at home.

All questionnaires were self-reports, because children are found to report more accurately their own internal processes than other-reports (e.g., parents or teachers) (Bettge, Wille, Barkmann, Schulte-Markwort, & Ravens-Sieberger, 2008). Instructions were provided clearly and simply, in an appropriate communicative way to ensure children's understanding. According to the preferred mode of

communication, DHH children could choose between two versions: a written version or a version in which each item was presented in written text and sign language (with videos of each item on a laptop) simultaneously.

Table 1 *Characteristics and demographic profile of participants*

	Total sample N = 208	
	DHH	Hearing
Number of children	78	130
Age mean in years (<i>SD</i>)	11;07 (1;04)	11;10 (1;08)
Age range in months	100 - 192	99 - 176
Sex - <i>n</i> (%)		
Male	37 (47%)	58 (45%)
Female	41 (53%)	72 (55%)
Degree of hearing loss ^a - <i>n</i> (%)		
Moderate (40-60 dB)	17 (22%)	
Severe (61-90 dB)	18 (23%)	
Profound (>90 dB)	37 (47%)	
Unknown	6 (8%)	
Preferred mode of communication - <i>n</i> (%)		
Oral language only	51 (65%)	
Combination of oral and sign language	25 (32%)	
Sign language only	2 (3%)	
Type of education - <i>n</i> (%)		
Regular education	47 (60%)	
Special education	31 (40%)	
Type of device - <i>n</i> (%)		
Hearing aid	49 (63%)	
Cochlear implant	29 (37%)	

^a Residual hearing was calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz.

Materials

The *Child Depression Inventory* (CDI) is for children between 6 and 17 years old (Kovacs, 1985). This self-report questionnaire contains 26 multiple-choice items about a specific category of signs and symptoms associated with depression (for example, "I feel like crying"). Each item consists of a self-evaluation sentence with a score in the direction of severity of the symptom. The item is scored from 1 (*symptom absent*) to 3 (*symptom is present always or most of the time*). The original version consists of three sentences per item. We converted these sentences to one sentence with three short answers, to shorten the reading time for DHH children (for example, "I do not like myself; I like myself a bit; I like myself" became "I like

myself" with the three options: *no, a bit, yes*). In a pilot study with 100 hearing children, high correlations were found between the original version and our version, $r = .75, p < .001$. The original CDI version had 27 items, but one item about suicide was deleted in order not to burden the children. The internal consistency of our version was good (Table 2).

Delinquency was measured with a questionnaire that concerns 10 minor delinquent offences children might have committed over the last four weeks, adapted from Baerveldt, van Rossem, and Vermande (2003). The original version of the questionnaire consisted of 19 delinquent behaviors, but due to a very low incidence of 9 items in a previous pilot study (with $N = 590$ participants), the 10 items that were reported most frequently were selected for this study. Examples are "shoplifting", "stealing from parents", and "letting another person's tyre down on purpose". The children were asked to choose from three possible responses (*never, once or twice, or three times or more*). All participants were explicitly told beforehand they would not be punished for their offences. This version had an acceptable internal consistency (Table 2).

For assessing *Theory of Mind* two false belief tasks were used, inspired by the classic Sally-Ann Task (Baron Cohen, Leslie, & Frith, 1985). The participants were presented with two short video clips of Mr. Bean. These clips were absent from any sound or spoken words, in order to minimize the potential verbal component of the tasks. After each video clip two questions were asked: one about a first order false belief and one control question. Children had to correctly answer both questions to pass the task. More detailed information about the exact content of these video clips and tasks can be obtained from the authors.

Being a Victim of Bully Behavior (*Being Bullied*) was assessed with a questionnaire developed for the purpose of the present study, based on the Bully/Victim inventory (Olweus, 1989). Before filling out the questionnaire, the children were given a definition of bullying, followed by several examples. They were explicitly explained that their answers would remain secret for their parents and friends. The questionnaire consists of 10 items (for example, "call somebody names", "say mean things", or "ignore a person"), which could be answered on a three-point scale (from 1 = *never* to 3 = *often*). The questionnaire had a good internal consistency (Table 2).

Emotion awareness was measured by the Emotion Awareness Questionnaire (EAQ), which consists of 30 items (Rieffe, Meerum Terwogt, Petrides, Cowan, Miers, & Tolland, 2007; Rieffe, Oosterveld, Miers, Meerum Terwogt, & Ly, 2008).

The self-report was designed for children over eight years old. It describes five key aspects of awareness of the own emotions: (1) Differentiating Emotions, (2) Verbal Sharing of Emotions, (3) Not Hiding Emotions, (4) Bodily Awareness of Emotions, and (5) Analyzes of (Own) Emotions. The focus of this paper is on the own emotions. Therefore, we removed one scale that assessed awareness of others' emotions, comprising five items. Respondents were asked to rate the degree to which each item is applicable to them on a three-point scale (*not true*, *sometimes true*, or *often true*). Just as the preceding self-reports, good internal consistency was found (Table 2).

Self-esteem was measured with the Children's Self-Confidence and Acceptance Scale (Rieffe, Meerum Terwogt, Bosch, Kneepkens, Douwes, & Jellesma, 2007). For this study, only the scale Global Self Worth was used (for example, "I'm happy with myself"), consisting of five items with the possible answers: *not true*, *sometimes true*, or *often true*. Nevertheless, one item was deleted ("I like myself") because of its conceptual overlap with one of the depression inventory items. The scale showed relatively good internal consistency (Table 2).

Table 2 Psychometric properties and mean scores of all questionnaires

	No. of items	Range	Cronbach's Alpha		Mean scores (SD)	
			DHH	Hearing	DHH n = 78	Hearing n = 130
Depression*	26	1-3	.73	.75	1.39 (.21)	1.33 (.20)
Delinquent Behavior	10	1-3	.68	.69	1.10 (.16)	1.13 (.19)
Theory of Mind***	4	0-2	n.a.	n.a.	1.45 (.64)	1.76 (.45)
Being Bullied	10	1-3	.82	.72	1.54 (.40)	1.46 (.30)
Emotion Awareness	25	1-3	.71	.73	2.14 (.25)	2.10 (.27)
Self-esteem	5	1-3	.66	.63	2.49 (.37)	2.52 (.35)

Abbreviation. n.a., not applicable

* p (one-tailed) < .05, ** p (one-tailed) < .01, *** p (one-tailed) < .001

An IQ *normscore* was computed with two performal subtests of the Wechsler Intelligence Scale (WISC): Block Design (copying small geometric designs with four or nine larger plastic cubes) and Picture Arrangement (sequencing cartoon pictures to make sensible stories) (Wechsler, 1991). Of 12 DHH and 17 hearing children IQ scores were not administered.

Two *language skills* of the participants were assessed: a sentence comprehension task and a narrative comprehension task to ensure that participants would

have sufficient language knowledge to understand and interpret the items in the psychosocial questionnaires. Children's language scores were measured in their preferred mode of communication, which was also the communication mode during the whole testing procedure. Hearing children and DHH children using the oral language received the two subtests from the Dutch version (Kort, Schittekatte, & Compaan, 2008) of the *Clinical Evaluation of Language Fundamentals® - Fourth Edition (CELF® - 4*; Semel, Wiig, & Secord, 1987). DDH children who use sign language or sign supported Dutch received the subtests from the *Assessment instrument for Sign Language of the Netherlands (ASLN*; Hermans, Knoors, & Verhoeven, 2010). In both the oral and signed versions of the narrative comprehension task children received short stories after which questions were asked. In the sentence comprehension task, children were presented with sentences and four multiple-choice answers. Children were instructed to select the answer(s) that matched with the sentence. Children's language scores were transformed to age appropriate norm scores. Furthermore, these norm scores were transformed to z-scores to enable calculation of one sentence comprehension score and one narrative comprehension score for all participants. Of 12 DHH and 16 controls the narrative comprehension task was not administered, and of 7 DHH and 16 controls the sentence comprehension was not administered.

Statistical analyzes

In order to make a comparison of the prevalence of depressive symptoms between the DHH and hearing group *t*-tests were carried out. Secondly, relations between depressive symptoms and the intrapersonal and interpersonal variables were established by means of correlation analyzes. Finally, it was examined which aspects of interpersonal functioning independently influenced symptoms of depression, over and above intrapersonal functioning. Depressive symptoms was the dependent variable and aspects of interpersonal and intrapersonal functioning were the independent variables. The program *Statistical Packages for the Social Sciences* version 17.0 was used.

Results

Group differences on Depressive symptoms and the Interpersonal and Intrapersonal variables

From Table 2 it can be seen that DHH children reported more Depressive symptoms and have a lower ToM score than the hearing children. No other group differences were found.

Correlation analyzes

Correlations (Spearman's rho) between Depressive symptoms and the interpersonal and intrapersonal variables for the DHH and hearing group are shown in Table 3. In both groups, Being Bullied is associated with more Depressive symptoms. Yet, only for the DHH group, a lower ToM score is associated with more Depressive symptoms, while only for the Hearing children Delinquent behavior is linked to increased Depressive symptoms. Emotion awareness and Self-esteem are negatively related to Depressive symptoms in both groups. Additionally, the differences between group correlations were tested for their significance. This revealed only a significant group difference in the correlation for ToM with Depressive symptoms ($p < .05$).

Table 3 *Correlations among Depressive symptoms and all variables for the DHH and Hearing groups*

	Depressive symptoms	
	DHH	Hearing
Delinquent behavior	.11	.20*
Theory of Mind	-.38**	-.08
Being Bullied	.59***	.47***
Emotion Awareness	-.54***	-.40***
Self-esteem	-.46***	-.44***

* $p < .05$, ** $p < .01$, *** $p < .001$

Interpersonal and Intrapersonal variables predicting Depressive symptoms

Hierarchical regression analyzes with two steps were conducted to evaluate the unique contribution of the interpersonal and intrapersonal variables on Depressive symptoms in the DHH and hearing groups separately. These regression analyzes were also carried out with Age, Sex, and Language ability

scores. Because these variables did not make a significant contribution, they were omitted from the results.

As can be seen in Table 4, the interpersonal variables in Step 1 explain a relatively large part of the variance in both groups (28% and 29% in the DHH and hearing group respectively). Adding the interpersonal variables in Step 2 resulted in a significant increase of explained variance (55% and 41% in the DHH and hearing group respectively). The patterns revealed in the correlation analyzes can be observed here again. In Step 1, a higher score for Being Bullied and a lower ToM score are predictive of Depressive symptoms in the DHH group. In the hearing group, higher scores for Being Bullied and Delinquency are associated with increased Depressive symptoms.

In Step 2, with the addition of the intrapersonal variables, Emotion Awareness and Self-esteem contributed negatively to Depressive symptoms in both groups, over and above the interpersonal variables. The unique contribution of Being Bullied to the prediction of Depressive symptoms remained in both groups. In the DHH group, ToM scores also remained uniquely contributive to Depressive symptoms. Yet, the hearing group, Delinquency lost its contribution to Depressive symptoms with the addition of the intrapersonal factors in Step 2.

Table 4 Hierarchical regression analysis

	Depressive symptoms			
	DHH		Hearing	
	R ²	β	R ²	β
Model 1	28%		29%	
<i>Interpersonal variables</i>				
Delinquency		-.00		.24**
Theory of Mind		-.23*		-.09
Being Bullied		.45***		.47***
Model 2	55%		41%	
<i>Interpersonal variables</i>				
Delinquency		-.05		.14
Theory of Mind		-.22**		-.08
Being Bullied		.29**		.35***
<i>Intrapersonal variables</i>				
Emotion Awareness		-.41***		-.18*
Self-esteem		-.30***		-.29***

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Consistent with the literature (Konuk, Erdogan, Atik, Ugur, & Simseyilmaz, 2006; Van Eldik, 2005), the DHH children and young adolescents in this study reported depressive symptoms more frequently than their hearing peers. In an attempt to gain more insight into the possible pathways leading to such symptoms we tried to unravel the factors associated with these internalizing symptoms. To this end we investigated the extent to which different aspects of children's intrapersonal and interpersonal functioning were uniquely associated with their self-reported symptoms of depression. The two groups (DHH and hearing) were examined separately.

To date, the literature has focused on intrapersonal factors such as emotional functioning as an explanation of childhood depression. The importance of these factors in explaining internalizing symptoms was confirmed again in our study. In both groups, the intrapersonal indices used in this study such as emotion awareness and self-esteem, were important contributors to the prediction of depression. In hearing children the social indices of victimization and delinquency were also strongly associated with depression, and initially contributed to depressive symptoms, as can also be found in other studies (Boney McCoy & Finkelhor, 1996; Van Voorhees et al., 2008). Although the association with victimization remained, the association of delinquency with depression disappeared after emotion awareness and self-esteem had been added to the regression model.

Delinquent behaviors were reported as often by DHH children as by their hearing peers. Yet, unlike hearing children, in our DHH group these kinds of socially maladaptive behaviors were unrelated to levels of depression. Instead, the frequently noted poor social understanding (ToM) in DHH children proved predictive of levels of depression, over and above emotion awareness and self-esteem. Although language ability did not intervene with any of the outcomes it is worth noting that the ToM task in this study consisted of two silent video clips that were completely non-verbal except for the test question asked. Despite the low demand on language ability in this task, the DHH group in this study fell behind their hearing peers in identifying the correct false beliefs. Most studies on false beliefs in DHH children are carried out at a younger age (Peterson & Wellman, 2009), but this outcome indicates that in their early teens DHH children still have difficulties in understanding others' mental states. Moreover,

these problems with social understanding negatively affect other areas of functioning and their mental health.

Additionally, the fact that victimization and ToM abilities contributed uniquely to the prediction of levels of depression in DHH participants indicates that it is not their lack of social understanding that is at the root of their perceived peer problems and, in turn, their levels of depression. In fact, also in hearing children victimization remained uniquely associated with depression, despite their levels of emotional functioning or self-esteem. Previous studies have shown that problems in the domain of emotional functioning indeed evoke more peer victimization (Spence, De Young, Toon, & Bond, 2009). However, victimization obviously also causes more stress, negative emotions (especially fear of future victimization) (Boulton, Trueman, & Murray, 2010), and a lower self-esteem. In other words, it is unclear to what extent the relation between poor intrapersonal functioning and victimization is reciprocal. However, the outcomes in our study are based on cross-sectional data, which prevents us from drawing conclusions about causal relationships. Future studies could further investigate the validity of the assumptions made about causality in this study.

The fact that delinquency was no longer associated with levels of depression in hearing children after intrapersonal functioning was added to the regression model needs closer consideration. This outcome indicates that the frequently noted link between delinquency and depression is in fact mediated by children's intrapersonal functioning. It is possible that social maladaptive behaviors such as delinquent activities cause depressive symptoms only in children with intrapersonal problems. For example, children with a high self-esteem might show delinquent behaviors for other reasons than those found in children with a low self-esteem. Delinquent behaviors in higher self-esteem children might be more instrumental, directed towards obtaining certain goals, whereas these behaviors in lower self-esteem children might be more reactive, directed towards defending their objectives.

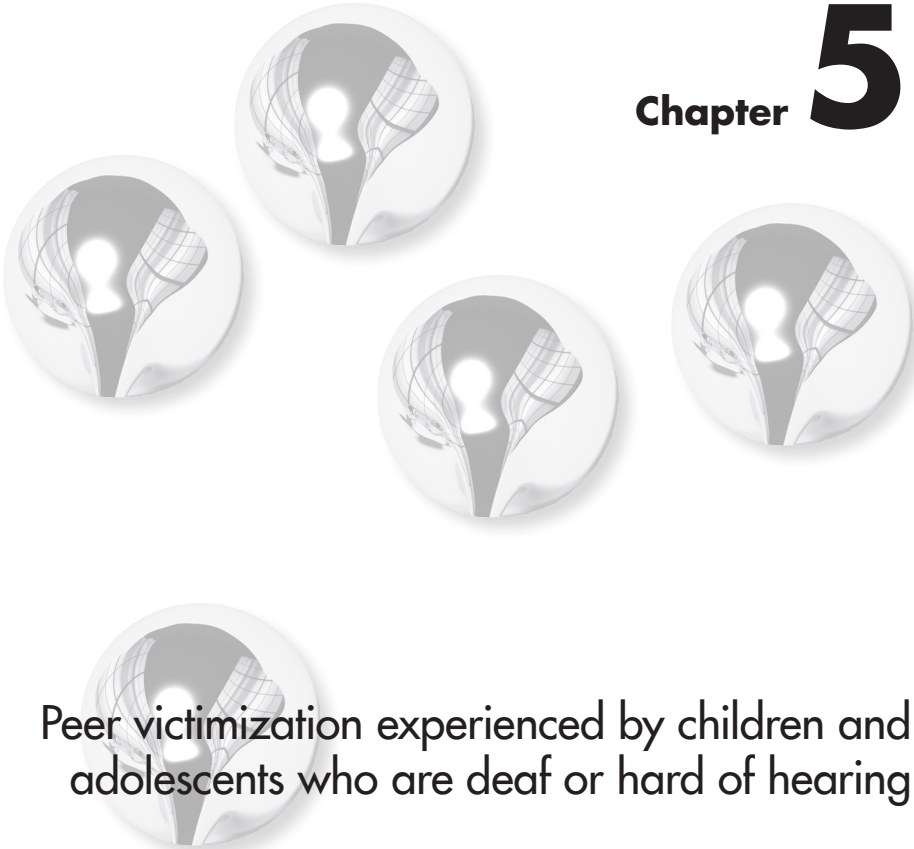
To conclude, the outcomes of this study indicate that both aspects of functioning in the intrapersonal and interpersonal domains are important when we try to understand self-reported symptoms of depression in children and young adolescents. DHH and hearing participants showed many similarities: emotion awareness, self-esteem, and being bullied were all uniquely associated with levels of depression in both groups. Yet, only in DHH children and adolescents did poor social understanding appear to be directly related to depressive symptoms.

Although in our study the language level of the DHH children was similar to that of their hearing counterparts, good communication, which is essential for adaptive social learning, entails more than just language skills: for example, taking turns in conversations, carrying on with a topic and asking questions. Many DHH children might have communication barriers with their mainly hearing parents (Mitchell & Karchmer, 2004), which make the children vulnerable in the area of psychosocial learning. In addition to lacking this direct learning, DHH children also fall behind hearing peers as regards indirect learning by ‘accidentally overhearing’, which means that they fail to become indirectly aware of discussions between hearing family members or friends.

Since these results pertain to understanding the mechanisms of the development of self-reported depressive symptoms in DHH youth, they may have broader implications. On the basis of our results, intervention programs for DHH children and adolescents could focus on the improvement of social understanding, besides the other factors we have identified as important for all groups. We hope that these findings will help to improve prevention, counseling and treatment trajectories for depressive symptoms in DHH children and adolescents specifically.



Chapter **5**



Peer victimization experienced by children and adolescents who are deaf or hard of hearing

Accepted as: Peer victimization experienced by children and adolescents who
are deaf or hard of hearing

Maartje Kouwenberg, Carolien Rieffe, Stephanie C.P.M. Theunissen,
& Mark de Rooij.

PLOS ONE, 2012

Abstract

Victimization is a relatively common, yet serious problem, with potentially severe consequences for children's psychosocial and academic functioning. Children who are deaf or hard of hearing (DHH) may be at a higher risk for victimization than hearing children. The aims of the present study were to compare DHH and hearing children on i) self-reported experiences of victimization and ii) associations between victimization, parental- and child variables. In total 188 children (mean age 11;11 years) from the Netherlands and Dutch-speaking part of Belgium participated in the study. No difference between DHH and hearing children were found on general experiences of victimization. However, differences between the groups were found on specific forms of experienced victimization and on the associations between victimization and parental variables. For DHH children, parental sensitivity and parents who challenge their DHH children to become competent in the practical, emotional, cognitive and social domain is associated with them being less victimized. For hearing children at this age these relations were reversed, absent or more complex. Finally, DHH children in special schools were more victimized than DHH children in regular schools. It can be concluded that parents can play an important role in reducing social problems experienced by DHH children and young adolescents.

Introduction

Deaf or hard of hearing (DHH) children might be at greater risk for victimization than hearing youth (Tresh, 2004). Nonetheless, few researchers have been concerned with victimization in this particular group. Chronic peer victimization increases the risk for various problems (e.g., anxiety, depression, and poor academic performance) during childhood and adolescence (cf. Boivin, Hymel, & Bukowski, 1995; Kouwenberg, Rieffe, & Theunissen, 2011; Perry, Hodges, & Egan, 2001), but also in adulthood (Bagwell, Newcomb, & Bukowski, 1998). It is therefore vital to understand the processes that underlie or protect against victimization during childhood and early adolescence. Past literature on hearing children and adolescents has suggested that both the home environment (e.g., parental behavior) and individual aspects (e.g., emotion regulation) are related to peer victimization (Swearer & Espelage, 2004). Consequently, the present study has two objectives: 1) to examine whether (subsamples of) DHH and hearing youngsters differ in prevalence of self-reported victimization; and 2) to analyze the impact of environmental and individual aspects on victimization among children who are DHH versus hearing children.

Victimization

Victimization occurs when a child receives negative attention or behavior repeatedly over time from one or more other children (Crick, 1995; Olweus, 1993). Unfortunately, at least 50% of all school children occasionally experience bully behavior (cf. Bond, Carlin, Thomas, Rubin, & Patton, 2001). A risk factor for being bullied is 'being different' from the majority (Flynt & Mortin, 2004; McCrone, 2004). Adding up to this, language difficulties and low levels of socially skilled behaviors have been associated with being bullied by peers (Card & Hodges, 2007; Sweeting & West, 2001). DHH children can be viewed as being different from the majority because of their observable hearing aids, use of sign language, and/or their distinct speech production. Moreover, DHH children's language problems and impaired socially skilled behaviors have been frequently reported (Traxler, 2000; Wauters & Knoors, 2008; Wolters, Knoors, Cillessen, & Verhoeven, 2011). All in all, these characteristics raise the question whether DHH children experience more victimization than hearing children. One previous study indeed revealed that DHH children were nominated to be bullied more often than their hearing classmates (Wauters & Knoors, 2008), whereas

self-report and parent-report studies failed to confirm this finding (Bauman & Pero, 2010; Kent, 2003; Percy-Smith, Caye-Thomasen, Gudman, Jensen, & Thomsen, 2008). Besides the fact that these results are mixed, the studies do not provide a full picture of various forms of victimization that can be experienced, in various settings (i.e., beyond the classroom), and among different subsamples of DHH children (e.g., those educated in special versus regular schools or those using signed versus spoken communication).

Another question is whether aspects that are related to victimization are similar in DHH children as compared to hearing children. In theory these should be the same. Alternatively they could be different, because DHH children are growing up in a sound-dominated world with less opportunity to acquire social-emotional knowledge than hearing children. Social-emotional knowledge is, for example, acquired through communicative exchanges between children and their parents (Denham, Renwick-DeBardi, & Hewes, 1994). These exchanges between DHH children and their overall hearing parents (Mitchell & Karchmer, 2004) might be limited due to communication barriers and/or lack of conversational depth and detail (Preisler, Tvingstedt, & Alström, 2002). Moreover, DHH children cannot, or to a lesser extent, make use of incidentally learning by overhearing conversations of others. Thus, their auditory deprivation affects the scope of daily learning opportunities about social-emotional functioning and, in turn, may alter associations between victimization and underlying factors typically found in hearing children.

Aspects associated with victimization

An aspect related to victimization in hearing children is the role of parents (cf. Bowers, Smith, & Binney, 1994; Ladd & Kochenderfer-Ladd, 1998; Veenstra, Lindenberg, Oldehinkel, Winter, Verhulst, & Ormel, 2005). Parents who are emotionally less stable, overprotective (i.e., treat children younger their age), and less sensitive to their children's needs increase the risk of their children being bullied. No known studies have been conducted on the emotional abilities of parents of DHH children. Additionally, no studies have examined whether parents infantilize their DHH children or have age-appropriate competency expectations. Yet, from research on parents of children with physical disabilities, like chronic illnesses, it is known that they treat children younger their age than parents of typically developing children (see Holmbeck, Johnson, Wills, McKernon, Rose, Erklin, & Kemper, 2002). Regarding sensitivity, research on very

young DHH children (from infancy to early childhood) found parents of DHH children and parents of hearing children to be equally sensitive to their children's needs (Lederberg & Mobley, 1990; Pressman, Pipp-Siegel, Yoshinago-Itano, & Deas, 1999), whereas other findings have implied parents of DHH children to be less sensitive (Meadow-Orlans & Steinberg, 1993). The interpretation of these outcomes is not straightforward though. A lower score does not necessarily imply that parents are less sensitive. Hearing parents of DHH children are generally limited in their ability to use language as a medium for sharing emotions and experiences with their DHH children (Preisler et al., 2002). This communication difficulty might prevent these parents from reacting the way they would with hearing children.

Children's ability to regulate their emotions is another important aspect in relation to victimization. Dysregulation of emotions can be observed in heightened levels of negative emotions, such as anger or sadness. Both cross-sectional and longitudinal research has shown that dysregulation of emotions is associated with victimization (Camodeca & Goossens, 2005; Kochenderfer-Ladd, 2004; Spence, De Young, Toon, & Bond, 2009). There are indications for emotion dysregulation in DHH children. Compared to hearing peers, DHH children express their anger more openly, and are less likely to communicate their anger strategically to the perpetrator, which could more easily cause escalation of the conflict (Hosie, Russell, Gray, Scott, Hunter, Banks, & Macauley, 2000; Rieffe & Meerum Terwogt, 2006). Additionally, externalizing problems, such as aggression, and internalizing, withdrawn behaviors are also more often reported in this group than in hearing children (Barker, Quittner, Fink, Eisenberg, Tobey, & Niparko, 2009; Stevenson et al., 2011; Theunissen, Rieffe, Kouwenberg, De Raeve, Soede, Briare, & Frijns, 2012; Van Eldik, 2005).

Purpose of study

Past studies helped us to acquire basic knowledge about victimization experienced by DHH children. Additional value of our study is the inclusion of a large, heterogeneous sample of DHH children, which enabled us to compare subsamples of DHH children with each other. Furthermore, by using self-report, we were able to examine children's own general experience of victimization in various settings beyond bullying that occurs within the classroom and is seen and rated by classmates. DHH children in special schools are often educated in classes with few children, which make results from peer ratings questionable for

this group and difficult to compare with children in regular education. Finally, we explored various forms of victimization rather than simply assessing if children are being bullied or not. DHH children are reported to be neglected more often than their hearing counterparts (e.g., Nunes, Pretzlik, & Olsson, 2001), which could cause differences particularly on items assessing ignorance and exclusion.

This study has two objectives. The first is to compare DHH and hearing participants on prevalence of victimization, and also on levels of parental variables and child variables. In addition, within the DHH sample, we will compare victimization among subsamples based on education type (special versus mainstream education), degree of hearing loss (mild, moderate, or profound), language mode (signed versus spoken language), and hearing device (regular hearing devices versus cochlear implants). A cochlear implant (CI) is a hearing device surgically implanted into the skull, where it converts sounds into electric signals which in turn stimulate the auditory nerve. This nerve leads into the brain, where the sound eventually is 'heard'.

Second, we will analyze the impact of parental variables and child variables on victimization, and whether the strengths of these relationships differ for children who are DHH or hearing. Indices for parental variables are: parents' emotional intelligence (parents' EI), parental sensitivity, and parents' expectations about the age-appropriate competencies their children should achieve (parents' expectations). Indices for the child variables on emotion dysregulation are their daily levels of anger and sadness. Additionally, communication between parents and DHH children will be assessed to examine whether potential differences between DHH and hearing children on parental variables were attributable to communication characteristics.

In line with findings from studies including parents of children with physical disabilities, we expect parents of DHH children to treat their children younger than their age and therefore have fewer expectations concerning their children's competencies compared to parents of hearing children (Holmbeck et al., 2002). Because it is more difficult for hearing parents to share experiences and emotions by means of language with DHH than with hearing children (Preisler et al., 2002), we also expect parents of DHH children to score lower on sensitivity. Additionally, we expect more emotion dysregulation in DHH children as compared to their hearing counterparts (cf. Barker et al., 2009; Theunissen et al., 2012). Based on the theory that fewer expectations concerning children's competencies, less

sensitive parenting, but more emotion dysregulation are associated with risk of being victimized, we expect DHH children to experience more victimization than hearing children. Concerning differences in victimization between different subsamples of DHH children, the current study is explorative.

A priori there are no grounds to expect any differences between DHH and hearing youth on relations between predictor variables and victimization. Alternatively, as a consequence of DHH children's higher vulnerability in a sound-dominated world, they might require their parents to have fewer expectations concerning certain competencies than hearing children. Additionally, parents' EI might less strongly affect DHH than hearing children, because DHH children lack the acoustic information to interpret the emotional displays and reactions of their parents appropriately. With the present empirical study we aim to unravel these relationships.

We chose the age range of nine to fifteen years old because over this period youngsters face many challenges attributable to biological, developmental, and social changes, which make this a risk period for the development of problems (Betts, Gullone, & Allen, 2009). Some researchers even claim that victimization reaches peak prevalence during this period (Spence et al., 2009). Moreover, during this period children make a transition from primary to secondary education. Past research found an effect of school transition on DHH children's well-being Wolters, Knoors, Cillessen, Verhoeven, 2012), which will also be briefly addressed in the current study regarding victimization.

Finally, it should be noted that past studies report gender differences to be less pronounced among victims than among bullies (Espelage, Mebane, & Adams, 2004). Though, for completeness, gender will be taken into account both in the scores on victimization as well as in the associations between prediction variables and victimization.

Method

Ethics Statement

The study was approved by the Medical Ethics committee of Leiden University Medical Center, Leiden, the Netherlands. Written parental consent was obtained for all children prior to data collection.

Table 1 *Characteristics of participants*

	Total sample (N = 188)	
	DHH	Hearing
Number of children - <i>n</i> (%)	94	94
Mean age in years (<i>SD</i>)	12;02 (1;10)	11;09 (1;04)
Age range in years	9;03-16;00	9;02-14;07
Sex - <i>n</i> (%)		
Male	48 (51%)	44 (47%)
Female	46 (49%)	50 (53%)
Questionnaire filled in by - <i>n</i> (%):		
Mother / Father /	70 (75%) / 17 (18%) /	71 (76%) / 15 (16%) /
Both / missing	6 (6%) / 1 (1%)	6 (6%) / 2 (2%)
Family composition - <i>n</i> (%)		
One-parent / Two-parent /	11 (12%) / 83 (88%) /	16 (17%) / 76 (81%) /
missing	-	2 (2%)
Socioeconomic status mean (<i>SD</i>) ^a	11.6 (2.2)	11.9 (2.4)
Ethnicity - <i>n</i> (%)		
Both parents Dutch	85 (90%)	78 (83%)
One or both parents other ethnicity	9 (10%)	13 (14%)
missing	-	3 (3%)
Degree of hearing loss ^b - <i>n</i> (%)		
Moderate (40-60 dB)	25 (27%)	
Severe (61-90 dB)	20 (21%)	
Profound (>90 dB)	45 (48%)	
missing	4 (4%)	
Preferred mode of communication - <i>n</i> (%)		
Oral language only	72 (77%)	
Sign or sign supported language	22 (23%)	
Type of education - <i>n</i> (%)		
Regular education	65 (69%)	
Special education	29 (31%)	
Type of amplification - <i>n</i> (%)		
Hearing aid	56 (60%)	
Cochlear implant	38 (40%)	
Mean age of implantation (<i>range</i>)	4;01 (1;00-10;08)	
Mean number years of CI use (<i>range</i>)	8;02 (2;02-13;00)	

^a Socioeconomic status score was measured by parental education, occupation, and net income

^b Hearing losses of the DHH children were calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz.

Participants

In total 188 children and adolescents from the Netherlands and the Dutch-speaking part of Belgium were included in the study, of which 94 were DHH and 94 were hearing. An inclusion criterion for the DHH children was to have at least 40 dB hearing loss in both ears (calculated by averaging unaided hearing

thresholds at 500, 1000, and 2000 Hertz). Other inclusion criteria were: detection of hearing loss prelingually or perilingually, and no medical or developmental disabilities, such as learning disabilities or autism spectrum disorder. All DHH children were born into hearing families.

The control group of normal hearing children was matched for age, gender, socioeconomic status (SES; based on parental education, occupation and net income), nonverbal IQ, and language comprehension with the DHH group. Inclusion criteria were identical to the DHH group (i.e., no diagnosed disabilities). See Table 1 for specific details of DHH and hearing children. This information was obtained from medical records and parent questionnaires.

Materials

The questionnaires used in the present study addressed victimization, parental sensitivity, parents' expectations, parents' EI, and children's levels of sadness and anger. Additionally, communication between parents and DHH children was assessed. Parental sensitivity was drawn from both parent- and child-reports. Parents' expectations and parents' EI were drawn from parent-reports, while children's anger, sadness, and victimization were drawn from children's self-reports. All questionnaires had internal consistencies ranging from sufficient to good, as shown in Table 2. Within the DHH sample, results indicate sufficient to good internal consistency values for the spoken and sign language versions separately (ranging from $\alpha = .68$ to $\alpha = .88$).

Table 2 Psychometric properties of questionnaires

	No. of items	Range	Cronbach's Alpha		Means (SD)	
			DHH	H	DHH	H
Victimization	10	1-3	.81	.71	1.48 (.37)	1.45 (.29)
Parenting/parental variables						
Parental sensitivity (p-r)	10	1-5	.83	.80	4.21 (.45)	4.19 (.41)
Parental sensitivity (c-r)***	6	1-3	.74	.72	2.61 (.33)	2.78 (.26)
Parents' EI	30	1-7	.85	.74	5.60 (.63)	5.69 (.60)
Parents' expectations	21	1-3	.83	.77	2.77 (.21)	2.70 (.20)
Children's emotion dysregulation						
Anger	4	1-3	.79	.80	1.36 (.39)	1.44 (.45)
Sadness	4	1-3	.86	.81	1.36 (.47)	1.43 (.44)
Communication between parents and DHH children	6	1-3	.70	n.a.	2.48 (.38)	n.a.

Abbreviations. DHH, deaf or hard of hearing; H, hearing; p-r, parent-report; c-r, child-report; EI, Emotional Intelligence; n.a., not applicable.

*** $p < .001$

Parent measures

Parental sensitivity, the parent-report version, measures two different parenting behaviors, which according to a prior study by Van Aken, Junger, Verhoeven, Van Aken, and Deković (2007) were found to be associated with children's functioning. The first parenting behavior scale is Responsiveness, which includes four items and reflects the degree to which parents adequately and responsively react to the needs, signals, and conditions of their children (Dutch Parenting Questionnaire; Gerris, Van Boxtel, Vermulst, Janssens, Van Zutphen, & Felling, 1993). An example item is "I know very well what my child needs and feels". The second parenting behavior scale is Reinforcement of Good Behavior, consisting of six items, and this scale reflects how often parents praise their children's good behavior. Reinforcement of Good Behavior was derived from the Alabama Parenting Questionnaire (Frick, 1991; Shelton, Frick, & Wooton, 1996). An example item is "I praise my child when he behaves well". All items could be answered on a 5-point scale ranging from 1 = *never* to 5 = *always*. The two scales were positively related to each other and correlations with other variables included in this study were in a similar direction. A mean score was calculated over the two scales, indicating Parental sensitivity.

Parents' emotional intelligence was measured with the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; Petrides & Furnham, 2004). The TEIQue measures emotional intelligence or emotional self-efficacy by means of emotion-related behavioral dispositions and self-perceived emotion abilities. The Dutch version (Mavroveli, Petrides, Rieffe, & Bakker, 2007) consisting of 30 items was used for this study. The participants were asked to respond to the items on a 7-point scale (from 1 = *disagree* to 7 = *agree*). An example item is: "I often experience difficulties with regulating my emotions". Some items are negatively formulated and thus reverse scored.

The questionnaire to assess *Parents' expectations* of their children's competencies was based on the Competence model of Slot and Spanjaard (1996) and further developed by a team of developmental psychologists and a child psychiatrist for the purpose of this study. The Competence model describes practical, emotional, cognitive, and social competencies children and adolescents should typically achieve at certain developmental phases. The questionnaire consists of 21 statements. Parents were asked to indicate on a 3-point scale the importance that their child is able to act, or has knowledge about something described by the statement (from 1 = *not important* to 3 = *important*). An example of a statement

is: “I think it is important that my child is able to make appointments on his/her own to play or do activities with friends”.

Child measures

The questionnaire to assess *victimization* among children was based on the Bully/Victim Inventory (Olweus, 1989). The questionnaire consists of ten items covering physical, verbal, and indirect bullying (refer to Table 3 for the items). Ignorance and neglect can be a bully experience specific for atypically developing children, such as DHH children (Nunes et al., 2001). Therefore, the item “Are you invited to birthday parties?” (which was reverse scored) was included to tap into this. The reliability of the questionnaire has been proven in past research (Rieffe, Camodeca, Pouw, Lange, & Stockmann, 2012). All items could be answered on a 3-point scale (from 1 = *(almost) never*, to 3 = *often*). Prior to completing the questionnaire, the participants were given a definition of bullying, followed by several examples (see Appendix A).

Parental sensitivity from the children’s perspectives was assessed with the Children’s Self-Confidence and Acceptance Scale (Rieffe, Meerum Terwogt, Bosch, Kneepkens, Douwes, & Jellesma, 2007). This questionnaire measures children’s self confidence and social acceptance in several domains, of which the parent domain was used in this study. Participants were instructed to score each item on a 3-point scale (from 1 = *not true* to 3 = *often true*). An example item is: “My mom or dad makes time to listen to me”.

Communication between parents and DHH children was measured with a six item questionnaire developed for the purpose of this study. Children could answer questions on a 3-point scale (from 1 = *(almost) never* to 3 = *often*). An example item is “My parents look at me, when they want to communicate with me”.

The *Mood questionnaire* (Rieffe, Meerum Terwogt, & Bosch, 2004) comprises four mood scales (three negative: anger, sadness and fear; one positive: happiness). In the present study, only the scales for anger and sadness were used, because these were found to be related to victimization in past literature. Each scale consists of four items. Children were asked “How have you been feeling the past four weeks?” as an introduction to the items, and instructed to score each item on a 3-point scale (from 1 = *(almost) never*, to 3 = *often*). Example items are: “I feel angry” and “I feel sad”.

Table 3 *Items in the Victimization Questionnaire*

-
1. Are you hit, pushed or kicked?
 2. Are you called names?
 3. Are mean things said to you? (also by msn, text message, email or social media)
 4. Do other children talk viciously about you?
 5. Are you laughed at?
 6. Are your things/belongings snatched?
 7. Are others ignoring you?
 8. Are you told that you cannot participate?
 9. Do others make you do things, which you actually do not want to do?
 10. Are you invited to parties? (*Reverse coded*)
-

Indices for children's nonverbal intelligence and language performance

To obtain an indication for *nonverbal intelligence* of the children, we used two subtests of the Wechsler Intelligence Scale for Children – Third Edition (WISC-III): Block Design (copying small geometric designs with cubes), and Picture Arrangement (arranging pictures to make logical stories) (Kort et al., 2002; Wechsler, 1991). In a random sample of 23 DHH children, we found high correlations between the present two intelligence subtest scores and earlier assessed complete nonverbal intelligence scores (i.e., $r = .79$, $p < .001$). These tests were either the WISC or the Snijders-Oomen Nonverbal Intelligence Test (Tellegen & Laros, 1993). We did not obtain IQ normscores for six DHH and four hearing children, due to time constraints.

Children's *language performance* was assessed with a story- and a sentence-comprehension task. These tasks were used to ensure that children would have sufficient language knowledge to comprehend the items in the psychosocial questionnaires. Hearing children and DHH children using spoken language received the two subtests from the Dutch version (Kort, Schittekatte, & Compaan, 2008) of the *Clinical Evaluation of Language Fundamentals® - Fourth Edition (CELF® - 4*; Semel, Wiig, & Secord, 1987). DDH children who use sign or sign supported language received the subtests from the *Assessment instrument for Sign Language of the Netherlands (ASLN*; Hermans, Knoors, & Verhoeven, 2010). Both tests were comparable with regard to content. Children's language scores were transformed to age-equivalent scores. To 5 DHH and 14 controls the story-comprehension task was not administered, and to 8 DHH and 14 controls the sentence-comprehension was not administered, due to time constraints.

Procedure

DHH children were recruited from ambulatory care organizations, hospitals, via specific magazines and websites for DHH individuals, and from primary and secondary schools for the deaf and hard of hearing. The group of hearing children was drawn from primary and secondary mainstream schools. These schools were randomly selected, although it was ensured that they accurately reflect the educational system of the Netherlands. The parents of the children received information packages about the study and were invited to participate. All participants were individually tested at school or at home in two sessions that lasted from 30 minutes to one hour. The two sessions were approximately one week apart. Before actual data collection began, participants were informed that they could request clarification on any item or question from the researcher present. This researcher communicated with the DHH participants in their preferred mode of communication (spoken, sign supported or sign language). Participants were made familiar with the testing procedure by an introduction and sample questions. Parents could privately fill in their questionnaires through a secured internet survey, or via a paper version that could be sent back to the research group. Information of the children and parents were processed anonymously, but could still be matched by using a unique code for each child. During data collection, children viewed items one at a time in written Dutch on a laptop, with beneath three response buttons. DHH participants proficient in sign or sign supported language viewed a video clip of the signed item, in addition to the written Dutch version. Translation from Dutch into sign language was done by a qualified sign language interpreter, after which the items were videotaped, signed by either a deaf individual or a sign language interpreter. Back translation did not show divergence between translated and original items.

Results

Differences between DHH and Hearing children on Victimization and predictor variables

First, the complete sample of DHH youth was compared to hearing youth on mean levels of Victimization. This revealed no significant difference between the two groups ($t(186) = -.68$; $p = .50$). Further explorative examination of Victimization on item-level by means of a 2 (Group: DHH and hearing) $\times$ 10 (Victimization

items) Multivariate Analysis of Variance (MANOVA) did reveal a multivariate effect for Group ($F(10,177) = 3.13, p < .001$, partial $\eta^2 = .15$). DHH children reported feeling more ignored ($F(1,186) = 4.77, p < .05$; partial $\eta^2 = .025$), received more mean comments ($F(1,186) = 5.96, p < .05$; partial $\eta^2 = .031$), and reported fewer invitations to parties ($F(1,186) = 5.09, p < .05$; partial $\eta^2 = .027$) than their hearing peers.

To explore potential differences on the predictor variables between the complete DHH sample and hearing sample, a 2 (Group: DHH and hearing) $\times$ 6 (Variables: Parental sensitivity parent-report, Parental sensitivity child-report, Parents' expectations, Parents' EI, children's Anger and Sadness) MANOVA was carried out. Results showed a significant multivariate effect for Group ($F(6,181) = 4.38, p < .001$, partial $\eta^2 = .127$), indicating a significant difference between DHH and hearing children. Univariate tests with Bonferroni correction revealed that DHH children, but not their parents, reported a lower score on Parental sensitivity than hearing children ($F(1,186) = 14.66, p < .001$, partial $\eta^2 = .07$; see Table 2 for the mean values). No other group differences on parental behaviors or on children's levels of Anger and Sadness appeared.

Difference between subsamples of DHH children

To differentiate within the DHH sample, we ran an Analysis of Variance (ANOVA) in which each of four main effects (i.e., Education type, Hearing device, Degree of hearing loss, and Language mode) on Victimization were explored, with a correction for the remaining three main effects. Results showed a main effect for Education type ($F(1,85) = 9.29, p < .01$; partial $\eta^2 = .099$), while the main effects for Hearing device, Degree of hearing loss, and Language mode were non-significant ($F(1,85) = 1.31, p = .26$; $F(1,85) = .16, p = .69$; and $F(1,85) = .62, p = .43$ respectively). DHH children in Special education ($M = 1.66, SD = .34$) reported more victimization than DHH children in Regular education ($M = 1.40, SD = .36$)². A *t*-test was conducted to explore the effect of Education *level*³ on Victimization in DHH children. Results showed that this effect was not significant ($t(92) = 1.55$,

2 For a more comprehensive picture about DHH children's functioning in either mainstream or special education, possible language comprehension differences between the two samples of DHH children were explored. A MANOVA revealed an overall effect for Group ($F(2,79) = 6.12, p < .01$; partial $\eta^2 = .134$). DHH children in Special education had lower Story comprehension ($F(1,80) = 10.23, p < .01$; partial $\eta^2 = .118$) and lower Sentence comprehension ($F(1,80) = 10.31, p < .01$; $\eta^2 = .102$) than DHH children in Mainstream education.

3 Education *level* (i.e., primary or secondary education) should not be confused with the aforementioned and analyzed Education *type* (i.e., special or mainstream education).

$p = .12$). Two subsequent t -tests, in which the DHH sample was divided based on Education type, did also not reveal differences on Victimization in children in primary or secondary schools ($t(63) = 1.67, p = .10$, and $t(27) = -.07, p = .95$, for mainstream and special education respectively).

Gender differences

T -tests were carried out to examine gender differences. These analyzes revealed no differences on Victimization between boys and girls, both within the total sample ($t(186) = -.01; p = .99$), as within the samples of DHH children ($t(92) = -.38; p = .71$) and hearing children ($t(92) = .43; p = .67$). Furthermore, no differences were found between DHH girls and hearing girls ($t(94) = -.88; p = .38$), nor between DHH boys and hearing boys ($t(90) = -.08; p = .94$).

Correlations

Parental sensitivity child-report and Communication in the DHH sample. We examined whether the lower Parental sensitivity reported by DHH children compared to hearing children could be due to Communication characteristics between DHH children and their parents. Correlational analyzes between the two concepts (Parental sensitivity and Communication) revealed a significant positive correlation, $r = .55, p < .001$.

Table 4 Spearman correlations between Victimization, parental- and child variables

	Parental variables				Child variables	
	2.	3.	4.	5.	6.	7.
1. Victimization	.18/-.17	-.22**	-.07	-.05/-.35**	.22**	.41***
2. Parental sensitivity (parent-report)	-	.02	.40***	-.10/.21*	-.12	-.05
3. Parental sensitivity (child-report)		-	.09	.08	-.20**	-.16*
4. Parents' EI			-	.10	-.04	-.05
5. Parents' expectations				-	-.11	-.14
6. Anger					-	.16/.55***
7. Sadness						-

Note. Correlations are provided separately for Hearing and DHH participants when these were found to be significant different (using Fisher Transformation) (Hearing/DHH)

* $p < .05$, ** $p < .01$, *** $p < .001$

Victimization. Spearman correlations are shown in Table 4. Victimization is negatively correlated with Parental sensitivity child-report (Parental sensitivity CR) and positively with Sadness and Anger in both groups. A difference between

the groups was also found: only in the DHH group Victimization was negatively correlated with Parents' expectations.

Parent and Child predicting variables. Parental sensitivity parent-report (Parental sensitivity PR) was positively related to Parents' EI, while Parental sensitivity CR was negatively related to children's Anger and Sadness in both groups. Solely in the DHH group significant positive associations were found between Parental sensitivity PR and Parents' expectations and between Sadness and Anger.

Table 5 Hierarchical regression analysis predicting Victimization from parental and child variables

	Victimization		
	R ²	Δ R ²	B
Step 1	9.9%		
Hearing status			.05
Parental sensitivity parent-report			-.06
Parental sensitivity child-report			-.18*
Parents' EI			.05
Parents' expectations			-.22**
Step 2	23.6%	13.7%	
Hearing status			.09
Parental sensitivity parent-report			-.01
Parental sensitivity child-report			-.11
Parents' EI			.03
Parents' expectations			-.16*
Anger			.06
Sadness			.37***
Step 3	29.4%	5.8%	
Parental sensitivity parent-report			.23*
Sadness			.31**
Hearing status* Parental sensitivity parent-report			-.32**
Hearing status* Parents' expectations			-.21*

Notes. Hearing status means DHH or hearing. In Step 3 only significant main- and interaction effects are shown in the table.

* $p < .05$, ** $p < .01$, *** $p < .001$

Parent and Child variables associated with Victimization

A hierarchical regression analysis with method enter was carried out to evaluate the unique value of parental variables (step 1), child variables (step 2), and interactions between hearing status and parent and child variables (step 3) in predicting victimization. With this final step we were able to assess whether the associations of parental variables and child variables with victimization differ for children who are DHH or who are hearing. Parental variables were entered to the

model before child variables. If parental variables lose significant contribution when child variables are added to the model, this might indicate that the parental variables affect the child variables, which in turn affects children's functioning. Also Gender and Age were included in the analyzes, but did not make significant contributions; therefore these were omitted from further discussion of results. As shown in Table 5, in the first step Parental sensitivity CR and Parents' expectations were negatively related to Victimization. When the child variables were entered into the model, Parental sensitivity CR lost significant contribution, whereas Sadness made a significant positive contribution to Victimization. In the final step the interaction terms were entered and this revealed two significant interaction effects: between 1) Hearing status and Parents' expectations, and 2) Hearing status and Parental sensitivity PR. To examine these interaction effects, we followed the Aiken and West procedure (1991) to calculate and plot the effects of Parental sensitivity PR, and Parents' expectations on Victimization for both DHH and hearing participants separately.

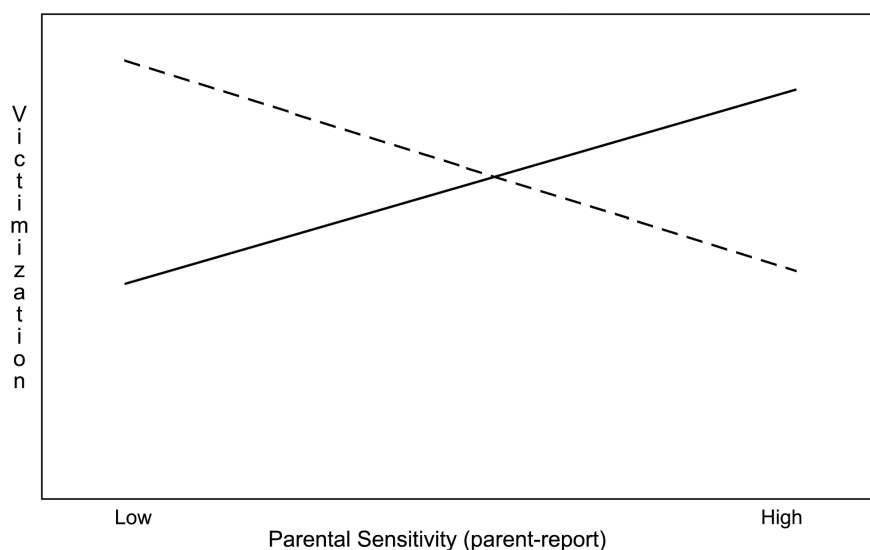


Figure 1 Associations between Parental sensitivity PR and Victimization for DHH (dotted line) and hearing children separately

As can be seen in Figure 1, the relation between Parental sensitivity PR and Victimization is opposite for DHH and hearing children; in the DHH group the relation is negative, and in the hearing group the relation is positive.

Furthermore, Figure 2 shows that the relation between Parents' expectations and Victimization only applies to the DHH group.

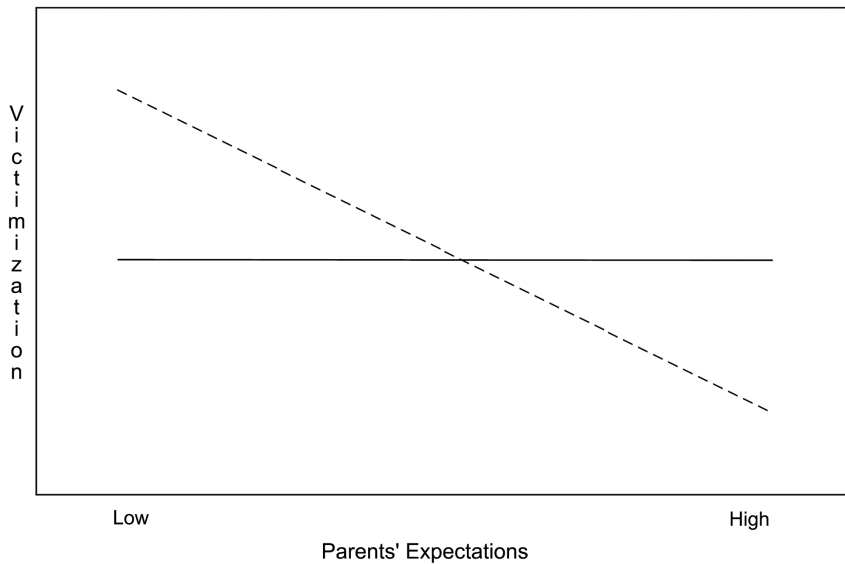


Figure 2 Associations between Parent's expectations and Victimization for DHH (dotted line) and hearing children separately

Discussion

Victimization

The outcomes of this study showed that DHH children reported victimization as often as their hearing peers, congruent with other studies in which children's own experiences were assessed (Bauman & Pero, 2010; Kent, 2003). The level of hearing loss (moderate, severe or profound) does not effect experience of victimization, nor does the type of hearing device (CI or traditional hearing devices) or language mode (sign supported versus spoken language).

Nevertheless, the DHH children in special education reported victimization more often than DHH peers in regular education. Possibly, outside school in their own neighborhood, these children are a target of victimization because they are different by attending a special school, or because of communication difficulties between them and the hearing children next door. It could also be that in the special classes, DHH children of various levels of intellectual, linguistic, and

social emotional abilities are placed together, creating large differences between children and therefore increasing the risk for victimization (Weiner & Miller, 2006). Additionally, children in special schools experience more difficulties than children in regular education, most likely due to these students' special characteristics and not the education type itself (Fellinger, Holzinger, & Pollard, 2012). This discrepancy is exemplified by our observation of significant lower levels of language competence in DHH children attending special education compared to DHH children attending mainstream schools. Relatively lower levels of language competence have been found to be related to poor peer relationship quality (cf. Fellinger, Holzinger, Beitel, Laucht, & Goldberg, 2009).

Additionally, differences between the overall samples of DHH and hearing children occurred when they were compared on item-level victimization. DHH children reported fewer invitations to parties, received more mean comments, and being more often ignored than hearing children. Thus, although the overall results are positive, parents, teachers and/or professionals working with DHH children should bear in mind that problems in specific areas may be present in order to enhance positive peer interactions between DHH children and their (DHH or hearing) peers.

Parenting

Parents of DHH and hearing children reported equal expectations concerning their children's competencies and equal levels of sensitivity towards their child. However, DHH children reported their parents to be less sensitive than hearing children. DHH children reported, more often than their hearing peers, that their parents make less time to listen to them and value them less important. Previous studies stated that parents ask their DHH children less often about their school day or plans for the coming day, and talk less with them about their friends than parents of hearing children (Brubaker & Szakowski, 2000). Thus, the reported lower parental sensitivity may be the result of communication-related facets of parenting behaviors, rather than parents being less caring or sensitive. This is underlined by the fact that we found an association between parental sensitivity and communication between parents and DHH children, such that a higher score on communication was related to more parental sensitivity. Another argument supporting a communication-related explanation is the fact that DHH and hearing children equally often report that their parents do nice activities with them.

Emotion dysregulation: levels of sadness and anger

Contrary to our expectations, no differences were reported between DHH and hearing children on overall mean levels of sadness and anger, implying compatible levels of emotion regulation in both groups. Yet, results from the bivariate correlational analyzes showed that the correlation between anger and sadness is higher in DHH children than within the hearing sample (i.e., $r = .55$ and $r = .16$, respectively, refer to Table 4). Possibly, DHH children have more difficulty in discriminating between emotions within the negative spectrum. Previous findings by Rieffe (2012) suggest similar patterns. The emotional functioning of DHH children therefore remains an area worth considering in future research. Future directions must move beyond simply mean scores, and consider associations between variables.

Variables associated with victimization

With this study we also examined how parental and child variables were related to victimization in hearing versus DHH children. For both groups, the overall picture emerged that child-reported parental sensitivity is associated with children being bullied, and can be measured by their level of sadness. This is in line with previous research, which has suggested that parenting styles can affect children's ability to regulate their emotions, which in turn affects children's social adjustment (cf. Eisenberg et al., 1998; Morris et al., 2007).

Two important differences appeared between the groups regarding the associations between parental variables and victimization. First, parents' expectations were related to less victimization in DHH but not in hearing children. Parents who have fewer expectations regarding their children's competencies may restrict children's exposure to daily life challenges. This, in turn, interferes with children's opportunities to become independent and assertive individuals, and to learn interpersonal skills (Hoover & Oliver, 1996; Ladd & Kochenderfer-Ladd, 1998). The absence of this relation between parents' expectations and victimization in hearing children could be due to the fact that the items used in this study are age-appropriate for typically developing children. For example, traveling by public transport, making appointments with friends, or do some shopping on their own, are behaviors that hearing twelve-year-olds perform on a daily basis with minimal parental involvement. Yet, DHH children who are less independent and thus require more encouragement from their parents are also the children that are bullied more often.

Second, sensitivity by parents towards their children's needs was related to less victimization in the DHH group, but the opposite was true for the hearing group. It is thought that parents who are sensitive, and regularly adjust their responses to their children's needs and behaviors, communicate a sense of interest and involvement. They also provide children with feedback that may allow them a sense of control and influence over others (Ladd & Kochenderfer-Ladd, 1998) and thus, over peers and possible bullies. This hypothesis is supported by the child-reports about parents' sensitivity, and by parent-reports of parents of DHH children. Only parent-reports of sensitivity towards their hearing children revealed an opposite pattern: more parental sensitivity was related to more victimization in hearing children. Possibly, the sensitivity as it was measured by parents towards their hearing children is more appropriate and adaptive for a younger age group. Showing these behaviors at the current older age range might indicate that parents interfere too much with their hearing children's independence, which in turn makes them more vulnerable to victimization. For DHH children, these sorts of directive parents' behaviors appear to be adaptive at the age of 9 to 15. Future studies could perhaps include different age groups to compare what kinds of parental support and involvement is required for DHH and hearing children at different stages in their lives.

This recommendation also counts for the association between parents' emotional intelligence and children's victimization. For both groups, this association was not found in the current study. Possibly, the mechanism of modeling by which parents can influence their children (Bandura, 1977; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997) is applicable when children are at a younger age.

Implications for future research

Several implications for future research are given throughout the discussion. We would like to add that future studies concerning bully behavior among peers could include peer nominations and/or observational measures. Although we believe that self-reports are appropriate, including other-reports would enable comparison between subjective and objective experiences of victimization. In the current study we were also not aware of the parental experience of communication with their DHH child and how this compares to the child's experience. Future research could include both parent- and child-reports to assess communication from different viewpoints. A related topic worth in-depth examination is how

communication between parents and children affects the influence parents have on their children. It is known that successful exchange (regardless of modality) of ideas and information between parents and children is critical for the overall development in DHH youth (cf. Hintermair, 2006; Leigh, Maxwell-McGaw, Bat-Chava, & Christiansen, 2009). However, an association between communication and children's functioning is dissimilar from the question how communication affects parenting behaviors and, in turn, children's functioning. Results of the current study showed a relation between parent-DHH child communication and parenting behavior, yet, more careful exploration is required. Future studies should include a multimethod approach in which both parents and children are questioned and observed in their interactions.

Future research could also explore bidirectional and reciprocal associations between parenting styles and individual differences among children. Parents can affect their children's behavior, but children also react in ways that elicit certain parenting behaviors (cf. Cummings, Davies, & Campbell, 2000). For example, the positive association between parental sensitivity and victimization in their hearing children could alternatively indicate that parents are trying hard to be sensitive and to listen well to their victimized children. Longitudinal research in particular would enable examination of causality. Causal directions of relationships should be explored not only between parents and children, but also, for example, regarding the currently found association between children's level of sadness and victimization. This will unravel whether children's sadness makes them more vulnerable to being victimized or whether being victimized increases children's sadness.

Larger samples would make it possible to examine associations between predictor variables and victimization within the heterogeneous group of DHH children. Future research could include more children who use sign or sign supported language in particular ($n = 1$ and $n = 21$, respectively in this study). DHH children from deaf parents could additionally be included. Although this group is only about 5% of the DHH population (Mitchell & Karchmer, 2004), including DHH parent-child dyads would shed more light on the relationship between DHH children and their parents. Finally, in our sample no difference was found between DHH children with regular hearing devices and children with CI. In general, the CI children in our study are implanted at an older age (mean age = 4;01 years) than children are nowadays. Future research could focus on this rapidly growing group of early implanted children.

Conclusion

Overall, DHH children do not report to be victimized more often than hearing children, although a distinction should be made between DHH children in mainstream and special education. DHH children do report some forms of victimization more often than hearing children. Victimization should therefore not be neglected in DHH youth. The current research shows that parents can be included in intervention programs for reducing victimization in DHH children at the age range of 9 to 15 years. Parents who are sensitive towards their DHH children and challenge them to become competent in the practical, emotional, cognitive and social domain decrease their children's chance to be victimized.

Appendix A

Definition and examples of bully behavior:

Bullying is: again and again, on purpose, being mean to someone to hurt him or her. Or to make that person sad.

Examples of bully behavior are:

- laughing at or about somebody
- pushing, hitting or kicking
- scaring or threatening someone
- taking away things from someone.

Bullying can also be when you ignore a person, such as:

- telling someone to go away
- pretending you do not see that person

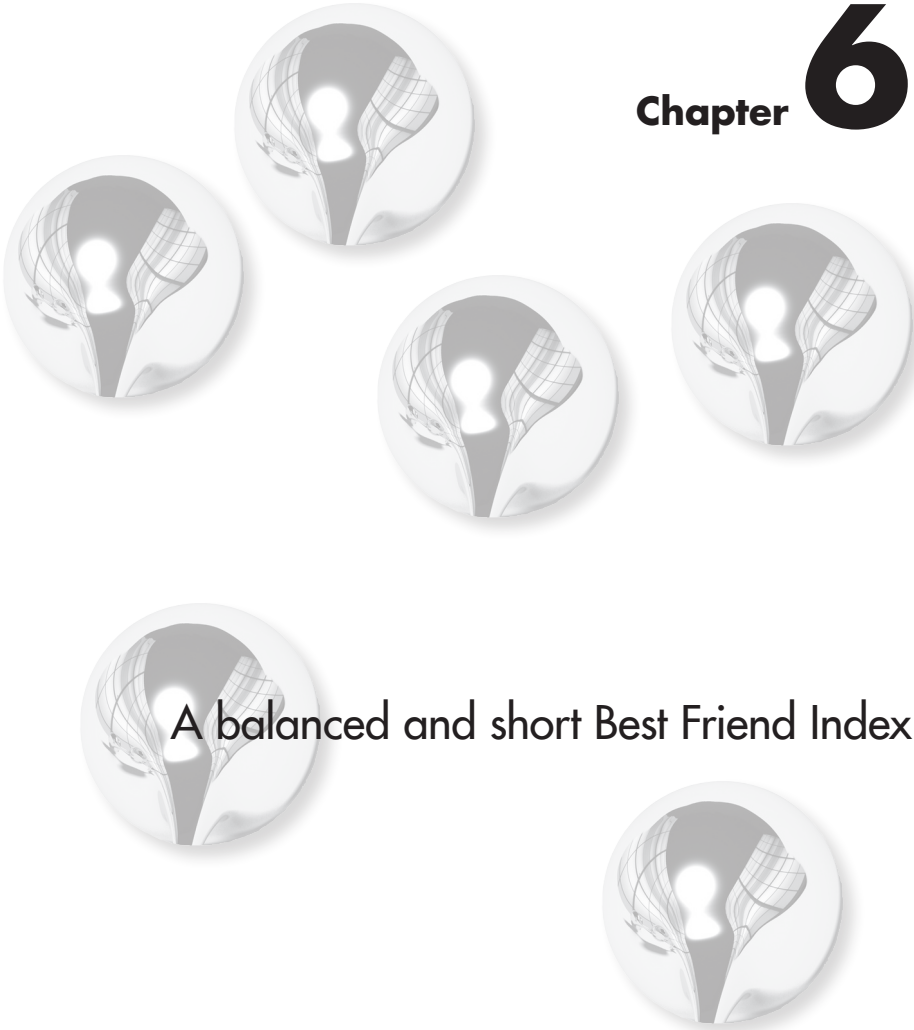
Bullying can occur in the streets, but you can also send a nasty text message with your mobile. Or you can block someone with msn.

Are you being bullied sometimes? Remember that your answers remain secret. The next questions are about other children who are bullying YOU. *[Followed by the items containing hurtful acts towards them]*

Note: This instruction is based on work by and personal conversation with Frits Goossens.



Chapter 6



A balanced and short Best Friend Index

Published as: A balanced and short Best Friend Index for children and young adolescents

Maartje Kouwenberg, Carolien Rieffe, & Robin A. Banerjee

European Journal of Developmental Psychology, 2011

Abstract

This study evaluated a short friendship questionnaire providing a balanced assessment of positive (e.g., support) and negative (e.g., jealousy) friendship features. In addition, associations with indices of adaptive functioning versus psychopathology were tested. The friendship questionnaire was presented to 548 typically developing children and young adolescents ($M_{age} = 11;01$ years). Results confirmed validity and independence of the two friendship features, and showed that negative friendship features were uniquely associated with symptoms of psychopathology, whereas both positive and negative features were, in opposite directions, uniquely associated with aspects of socio-emotional functioning.

6 Introduction

The importance and independence of positive and negative friendship qualities with regard to individuals' development has been proven in past research (cf. Bagwell, Bender, Andreassi, Kinoshita, Montarello, & Muller, 2005; Berndt, 2004; La Greca & Harrison, 2005). However, existing measurement tools of friendship quality are unbalanced, capturing many more positive than negative friendship features (e.g., Bukowski, Hoza, & Boivin, 1994; Furman & Buhrmester, 1985; Parker & Asher, 1993). Moreover, examination of the negative qualities is mostly concentrated around conflict and antagonism, whereas other negative qualities may also be present in a friendship. This constrains our ability to draw conclusions about the links between friendship quality and psychosocial functioning. In the present study a Best Friend Index (BFI) is evaluated in which the positive and negative friendship features are balanced. Furthermore, the semantics and syntactic structures of BFI items were relatively simple to address friendship quality in young samples, but also in clinical groups characterized by language problems and social difficulties, such as children with specific language impairments or those who are deaf or hard of hearing. Finally, the questionnaire was short, so it could be presented easily and quickly to children.

Purpose of study

The BFI consists of an equal number of items on both the positive and negative features scales (i.e., positive: companionship, reliable alliance, disclosure, support, and affection/admiration; negative: jealousy, dominance, conflict, betrayal, and competition). Our aim was to establish internal structure and homogeneity of these two scales. Furthermore, we wanted to evaluate construct validity by examining associations between the two friendship scales and related constructs identified in past research (cf. Bagwell et al., 2005; La Greca & Harrison, 2005; Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). These variables include adaptive dimensions of children's socio-emotional functioning (i.e., emotion awareness, empathy and self-esteem) as well as psychopathological symptoms (i.e., depression, social anxiety and aggression). Finally, gender differences emerged in previous studies on children's friendships (see Rose & Rudolph, 2006, for a review) therefore gender will be taken into account.

Method

Participants and procedure

The study was conducted with 548 children (249 boys and 299 girls) from regular primary schools in the Netherlands. The mean age of the boys was 11;01 years ($SD = .96$) and of the girls 11;01 years ($SD = .90$). The participants were tested in their classrooms. They received written versions of the questionnaires and filled these out individually. Before actual data collection began, response formats were explained and sample questions were provided. Written parental consent was obtained for all participants, prior to data collection. The local ethics committee granted permission for the research to take place.

Materials

The BFI is partly compiled and adapted from two sources: positive features from the Network Relationship Inventory (NRI; Furman & Buhrmester, 1985; Selfhout, Branje, & Meeus, 2008) and negative features from the Friendship Quality Questionnaire (FQQ; Parker & Asher, 1993). Because items of the NRI negative features scale have relatively complex syntactic structures (i.e., “How much do you and this person get upset with or mad at each other”), we included negative items from the FQQ. Additional negative items were developed by a team of developmental psychologists and a child psychiatrist. Items from the NRI and FQQ were translated into Dutch and modified in such a way that they all could be answered on a 5-point scale (from 1 = *never* to 5 = *very often*). Items were also adapted in order to simplify the syntactic structures (i.e., no compound or long sentences). An initial version of the BFI consisted of 28 items (11 from the NRI; seven from the FQQ; eight newly developed negative quality items; and two filler items to make the questionnaire less negative). The two filler items were removed and an additional eight items were deleted due to insufficient fit with the selection criteria (i.e., the phrasing of one item was too difficult; one item assessed qualities of the friend rather than the friendship; four items had insufficient loading on their intended factor; two items appeared to be covered by other items). This resulted in the current 18-item version (see Table 1), which gives the most unique information regarding friendship quality. Before rating the items, the participants were asked to write down the name of their best friend.

Table 1 PFF, NFF, and PCA factor loadings

Item	PFF	NFF
1. I turn to my best friend for support with personal problems	.673	
2. My friend and I have fun together	.426	
3. I think we will stay friends forever	.541	
4. My friend and I do enjoyable things together	.578	
5. I share secrets with my best friend	.657	
6. My friend makes me feel I do nice things	.609	
7. My friend helps me with things I do not know or cannot do	.624	
8. I enjoy helping my best friend	.611	
9. My friend shows me I am good at many things	.613	
10. My friend and I argue together		.560
11. I get fed up when my friend receives a higher grade.		.589
12. My friend and I are angry at each other		.599
13. I am jealous towards my friend		.628
14. My friend tries to boss me around.		.681
15. I dislike it when my friend is better than me at things		.685
16. My friend and I bug each other		.546
17. My friend tries to decide what we should play		.515
18. My friend says mean things about me to others.		.590

Questionnaires to assess social-emotional functioning and psychopathology

The self-report questionnaires had excellent internal consistencies ranging from $\alpha = .80$ to $\alpha = .94$. For each questionnaire a mean score was calculated.

Emotion awareness was assessed with the Emotion Awareness Questionnaire (EAQ; Rieffe, Oosterveld, Miers, Meerum Terwogt, & Ly, 2008). Children were asked to rate the 30 items about how they feel and what they think about their feelings on a 3-point scale (from 1 = *not true* to 3 = *often true*).

Aggressive behavior was assessed with a self-report version of the Instrument for Reactive and Proactive Aggression (Polman, Orobio de Castro, Koops, Van Boxtel, & Merk, 2007). Children were asked to rate six possible functions (e.g., "Because I was angry") for six forms of aggressive behavior (e.g., "kicking") on a 5-point scale (from 1 = *never* to 5 = *always*).

Depression was measured using the Children's Depression Inventory (Kovacs, 1992). Each of the 26 items consists of three self-evaluation sentences with a score in the direction of symptom severity. The children were asked to select the response that best describes how they felt over the preceding two weeks.

The *Social Anxiety Scale for Adolescents* (La Greca & Lopez, 1998) consists of 22 items (of which four were filler items). The participants were asked to score

how often the items apply to them on a 3-point scale (from 1 = *never* to 3 = *always*). *Empathic behavior* was assessed with the Interpersonal Reactivity Index (Davis, 1980). Children were asked to rate the degree to which each of the 24 items correspond to their own opinion or experience on a 5-point scale (from 1 = totally not true to 5 = totally true).

Children's Self-Confidence and Acceptance Scale was used to measure children's self-esteem (Rieffe et al., 2007). In addition to the original 20 items assessing children's self-esteem in various domains, a Global Acceptance scale of five items (e.g., "I believe I do things well") was added. The participants were asked to score the items on a 3-point scale (from 1 = *not true* to 5 = *often true*).

Results

Factor structure, internal consistencies and mean scores of friendship scales

A principal component analysis on the 18 items of the BFI, with the factor count set to two factors (Table 1), showed that all items loaded $> .40$ on their keyed factor (explaining 39.4% of the variance). Oblimin rotation with Kaiser normalization was used. The inter-factor correlation between the two scales was significant but moderate in magnitude ($r = -.39$; $p < .001$). The internal consistencies of the PFF and NFF were good, with $\alpha = .78$ and $\alpha = .79$, respectively. Finally, girls scored significantly higher on PFF, $F(2,545) = 20.25$, $p < .001$, $\eta_p^2 = .07$, ($M = 4.16$, $SD = .59$ versus $M = 3.84$, $SD = .57$ for girls and boys, respectively), while no significant gender differences were found on the NFF ($M = 1.58$, $SD = .53$ for girls; $M = 1.65$, $SD = .54$ for boys).

Correlation and multivariate regression analysis

As shown in Table 2, PFF were positively correlated to indices of social-emotional functioning, whereas PFF were negatively related to psychopathology. The relations of NFF with the variables were in the opposite direction as for the PFF, except that the relationship between NFF and empathic behavior was non-significant for girls. PFF and NFF were not related to Age (i.e., $r = -.01$, *n.s.* and $r = -.04$, *n.s.*, respectively).

Table 2 *Correlations between PFF, NFF, psychosocial variables, and Age*

	Psychopathology			Social-Emotional functioning		
	Aggression	Depressive symptoms	Social anxiety	Emotion awareness	Empathy	Self-esteem
PFF	-.24***	-.16***	-.09*	.29***	.33***	.33***
NFF	.36***	.36***	.26***	-.28***	-.23*** /.08	-.30***

Note. Correlations are provided separately for boys and girls when these were found to be significant different (using Fisher Transformation) for the two groups (boys/girls)

* $p < .05$, *** $p < .001$

Finally, a multivariate regression analysis was conducted, in which PFF and NFF were the independent variables. Indices of social-emotional functioning and psychopathology were the dependent variables. As shown in Table 3, the NFF were negatively associated with the socio-emotional functioning variables (except empathy), and positively with psychopathology, over and above the PFF. The PFF, on the other hand, were uniquely associated with more social-emotional functioning, but not with psychopathology.

Table 3 *Multivariate regression analysis*

	Psychopathology			Social-Emotional functioning		
	Aggression	Depressive symptoms	Social anxiety	Emotion awareness	Empathy	Self-esteem
	β	β	β	β	β	β
Age	.00	-.02	-.02	.04*	-.02	.01
Gender	-.18***	.04	.27***	-.08**	.25***	-.02
PFF	-.06	-.01	-.06	.11**	.24***	.11***
NFF	.31***	.16***	.31***	-.09***	.03	-.09***
R^2	17.4%	13.9%	10.9%	15.5%	17.0%	14.9%

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

In this study the validity of the Best Friend Index as a short and balanced measurement strategy for capturing individual differences in positive and negative friendship qualities is confirmed. The language (structure) of the questionnaire is relatively simple, which makes it also appropriate for children with language difficulties, such as various clinical groups experience. The

principal component analysis showed two clearly distinguishable factors; one representing positive friendship features and one representing negative features. The two scales that were constructed showed good internal consistencies and a relatively modest and negative intercorrelation, as should be the case for a multifaceted construct. It should be noted that age was not related to either type of friendship feature, indicating that at the age range of approximately 9 to 13 years, children exhibit similar levels of the assessed friendship features. Moreover, our results indicated that negative friendship features are not domain specific. Although negative features were reported more sporadically, they appeared to have a stronger connection with well-being, i.e., they appear to affect both positive and negative domains of functioning (cf. Rook, 2001). Positive features, on the other hand, seem to be more domain specific and are related particularly to more adaptive socio-emotional functioning. Children and adolescents experiencing psychopathological problems may benefit from intervention efforts that target negative friendship features.

Future research

The self-report methodology enabled us to examine children's friendship experiences in various settings beyond classroom friends; however, future research might benefit from a consideration of both parties in the friendship dyad, such as assessing mutuality in friendships. We further believe that future research in this area might benefit from longitudinal work, in which directionality of the associations between friendship quality and psychosocial functioning can be established. Additionally, the various dimensions of psychosocial functioning examined in this study may also influence each other, so future (longitudinal) work can raise the intriguing possibility of situating friendship quality (both positive and negative features) within a complex cycle of mediated psychosocial pathways.



Chapter 7



Best friends of children and adolescents who are deaf or hard of hearing

Submitted as: Deaf or hard of hearing youth and their friends: A longitudinal
exploration of best friendships

Maartje Kouwenberg, Carolien Rieffe, Stephanie C.P.M. Theunissen,
Mark de Rooij, & Johan H.M. Frijns

Abstract

Although the importance of friends has been widely acknowledged, little is known about friendships of children who are deaf or hard of hearing (DHH). In this study, friendship quality and stability were examined in DHH ($n = 127$; $M_{age} = 11;11$) and hearing children ($n = 121$; $M_{age} = 11;08$). Also longitudinal regression analyzes with clustered bootstrap were run, to examine whether changes in social behaviors (i.e., empathy and aggression) caused changes in friendship quality. DHH children reported lower friendship quality, but equal friendship stability as compared to hearing children. Additionally, changes in social behaviors caused changes in friendship quality in both groups. In DHH and normal hearing children their friendship quality could be enhanced by increasing their social abilities.

Introduction

Children and adolescents who are deaf or hard of hearing (DHH) have been reported to experience social difficulties (e.g., Fellingner, Holzinger, Beitel, Laucht, & Goldberg, 2009; Remine & Brown, 2010), but this study is the first to longitudinally explore their best friendships. The importance of examining friendships is underscored by the fact that these peer relationships are found to serve a protective factor against psychopathology and victimization in (hearing) children (La Greca & Harrison, 2005; Vitaro, Boivin, & Bukowski, 2009). Besides comparing mean levels of friendship quality and stability between DHH and hearing children, we aim to contribute to the understanding of mechanisms that cause changes in friendship quality over time.

In DHH children, their language and communication difficulties have often been found as great drawbacks in forming and maintaining social relationships (e.g., Dammeyer, 2010). However, over and above language, one's social behaviors are of particular salience regarding friendships (Durkin & Conti-Ramsden, 2007). This was found in hearing children and a clinical sample that is as well known for their language difficulties, i.e., children with specific language impairments. In the current study, we aim to investigate the associations between social behaviors and friendship quality over time in DHH youth. We further examine if changes in social behaviors cause changes in friendship quality. This knowledge would support intervention and prevention programs directed at enhancing DHH children's social functioning.

Forming and maintaining friendships

Forming friendships can be more challenging for DHH children and adolescents than for their hearing counterparts. DHH children in mainstream classrooms are often reported to be less accepted, and more neglected than their hearing peers (Kluwin, Stinson, & Colarossi, 2002; Nunes, Pretzlik, & Olsson, 2001; Wolters, Knoors, Cillessen, & Verhoeven, 2011). Most studies have also shown that they have fewer friends than hearing children (Kluwin et al., 2002; Nunes et al., 2001). In fact, it has been proposed that hearing peers prefer to have hearing friends, whilst DHH children prefer to be friends with other DHH children (Kluwin, et al., 2002; Most, Ingber, & Heled-Ariam, 2011; Nunes et al., 2001). Nevertheless, although DHH youth in special education may be more alike, they experience even more difficulties forming friendships than their DHH peers

attending mainstream education (Keilman, Limberger, & Mann, 2007). When DHH children do form friendships, these appear to be shorter in duration than friendships between two hearing children (Lederberg, Rosenblatt, Vandell, & Chapin, 1987).

Friendship quality

By definition, a dyadic friendship involves a strong and affective bond between two individuals (Hartup & Stevens, 1997). Friends are generally thought to share feelings, secrets, companionship and other positive features. Yet, negative features can also arise within a friendship, such as high levels of conflict, rivalry and jealousy (Berndt, 2002; Kouwenberg, Rieffe, & Banerjee, 2012). Although the negative features seem unavoidable in close relationships, and are adaptive to a certain extent, too much can be harmful to one's well-being. For example, conflicts between friends are adaptive in that they provide the possibility to improve social (cognitive) skills (Laursen & Hafen, 2010). However, repeated conflicts within a friendship are less likely to provide such constructive opportunities.

This balance in friendship quality has not yet been examined in DHH children. Though, it is known from related constructs that DHH children report lower satisfaction concerning their friends (e.g., friends treat me well and are nice to me), and lower self-esteem in the friends' domain (e.g., sharing secrets and personal thoughts) than hearing children (Gilman, Eastbrooks, & Frey, 2004; Van Gent, Goedhart, Knoors, Westenberg, & Treffers, 2012). These findings indicate a lower friendship quality in DHH children as compared to hearing age-mates.

Social behaviors related to friendship quality

A social behavior that has a strong positive association with friendship quality in hearing children is empathy (Berndt, 2002; Bukowski, Newcomb, & Hartup, 1996; Smith & Rose, 2011). Empathy involves three inter-related facets: contagion (i.e., feeling what another person in distress feels), understanding of another's emotion, and prosocial behavior aimed at releasing distress in the other person (Eisenberg & Strayer, 1987). Contagion as such has not been studied in DHH children and young adolescents, but it is known that DHH youth show impairments or delays in understanding others' emotions, i.e., Theory of Mind (Peterson & Wellman, 2009). Findings regarding their prosocial behaviors are mixed. While some studies report fewer prosocial behaviors in DHH children (Wauters & Knoors, 2008; Wolters et al., 2011), other studies did not find a

difference between DHH and hearing children (Antia, Jones, Luckner, Kreimeyer, & Reed, 2011; Moog, Gustus, Geers, & Brenner, 2010). This discrepancy could have to do with different DHH samples explored, or with different methodology. For example, DHH in mainstream schools score higher on prosocial behaviors than DHH in special schools (Wolters et al., 2011). Observers or other informants may misinterpret DHH children's need for more linguistic and physical signals to react (Corina & Singleteon, 2009) as a lack of social ability.

A social behavior that can threaten high friendship quality in hearing children is aggression. Particular forms of aggression, such as relational aggression (i.e., nonphysical behavior intended to hurt) towards a third person, could strengthen a dyadic friendship (Banny, Heilbron, Ames, & Prinstein, 2011). Overt aggressive behavior (e.g., hitting and kicking) is related to poorer friendship quality (Cillessen, Jiang, West, & Laszkowski, 2005). Past results regarding aggressive behaviors displayed by DHH children are still not clear. Some studies showed that DHH children display higher levels of aggressive behavior than hearing children (Van Eldik, 2005; Wolters et al., 2011), while others failed to find a difference (Van Gent, Goedhart, Hindley, & Treffers, 2007; Remine & Brown, 2010). These differences also appear to be associated with different study samples. Considering education type, children attending mainstream schools report lower levels of aggressive behaviors than DHH attending special education (Van Eldik, 2005; Wolters et al., 2011).

Moreover, DHH children may value the significance of these social behaviors for friendships differently than their hearing peers. Previous research has found that DHH children expressed their anger bluntly in a conflict situation, and expected few empathic responses from a friend who caused them harm (Rieffe & Meerum Terwogt, 2006). Despite these behaviors that would negatively impact a hearing pair of friends, DHH still expect friendships to continue. In other words, this could indicate that the associations between empathy or aggression and friendship quality are weaker in DHH children as compared to hearing children.

Purpose of study

This study is the first to examine DHH children and young adolescent's close friendships in great detail, longitudinally, and from different angles (i.e., friendship quality, friendship stability, and relations between friendship quality

and social behaviors) with five aims. First, mean levels of perceived friendship quality in DHH and hearing children will be explored. Second, within the DHH sample the influence of factors that are characteristic for the DHH group will be examined. Various DHH-related characteristics have been assumed to influence children's functioning, but empirical findings are thus far inconclusive (e.g., Polat, 2003; Antia et al., 2011, Van Gent et al., 2012). We will examine the influence of education type (special or regular), language mode (signed or spoken), degree of hearing loss (from moderate to profound), age at detection of hearing loss, and hearing device (cochlear implant or regular hearing device) on friendship quality. Children profit considerably from cochlear implant(s) (CI) in terms of their speech and language development, though they appear to function socially as DHH children without CI (Punch & Hyde, 2011). In this respect, two additional DHH-related characteristics worth exploration are age at implantation, and duration of CI use.

The third aim is to examine friendship quality in different dyads of friends (i.e., hearing dyad, DHH dyad, or mixed dyad with one DHH and one hearing child). Fourth, friendship stability over three data collections will be studied. Fifth, we will examine whether individual differences in changes in empathy and aggressive behavior over time can explain individual differences in changes in friendship quality in DHH children compared to hearing children.

The complete sample of DHH children is expected to have lower friendship quality and less stable friendships than hearing children. We predict that while the type of hearing device might not affect friendship quality, DHH children attending special education may experience lower friendship quality than DHH attending mainstream schools. The influences of language mode, degree of hearing loss, age at detection of hearing loss, age at implantation, duration of CI use, and hearing status of the dyad on friendship quality were explorative. Finally, the theory that fewer empathic and more aggressive behaviors are associated with a lower level of friendship quality should apply to both groups. Alternatively, we speculate that the association between empathy, aggression, and friendship quality is weaker in DHH children than in hearing children, because DHH children have less understanding of the significance of social behaviors in friendships. Finally, gender will be taken into account, since gender differences may be present in the study variables of interest (Crick & Grotpeter, 1995; Smith & Rose, 2011; Underwood & Buhrmester, 2007).

Method

Participants

In total, 248 children and adolescents ($n = 127$ DHH and $n = 121$ hearing) from the Netherlands and the Dutch-speaking part of Belgium were included at the first measurement of this study. Inclusion criteria for the DHH children were 1) to have at least 40 dB hearing loss in the best hearing ear (calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz), 2) detection of hearing loss pre- or perilingually (before the age of 5), and 3) no medical or developmental disabilities (e.g., learning disabilities or autism spectrum disorder). All but one DHH children were having hearing parents. A group of hearing children was matched with the DHH group for age, gender, socioeconomic status (SES; based on parents' education and occupation) and nonverbal IQ. No differences between the groups were found on language comprehension (i.e., story- and sentence comprehension), but DHH children did score significant lower than hearing children on (parent-reported) pragmatic language skills ($t(170) = -7.63$, $p < .001$). Inclusion criterion for the hearing group was to have no diagnosed disabilities. See Tables 1 and 2 for specific information of DHH and hearing children, which were obtained from parent questionnaires and medical records.

At Time 2, nine months later, 184 children were tested ($n = 79$ DHH and $n = 105$ hearing). All excluded DHH children ($n = 48$) were part of a cross-sectional sample and therefore tested once. At Time 3, again nine months later, 146 children participated ($n = 65$ DHH and $n = 81$ hearing). Parents of excluded participants at Time 3 were found to have a slightly higher SES than parents of included participants ($t(182.9) = 2.46$, $p < .05$, $M = 11.1$, $SD = 4.7$ versus $M = 9.7$, $SD = 3.7$, respectively). However, there was still no significant difference between DHH and hearing participants on SES at Time 3. Moreover, there were no differences on distribution of gender, or on mean age, nonverbal IQ, language comprehension, friendship quality, aggression, and empathy scores between included and excluded participants at Time 2 and Time 3.

Table 1 *Characteristics of participants*

	DHH	Hearing
Number of children - <i>n</i>	127	121
Mean Age in years (<i>SD</i>)	11;11 (1;09)	11;08 (1;04)
Age range in years	8;03 - 14;08	8;03 - 16;05
Gender - <i>n</i> (%)		
Male	64 (50%)	55 (45%)
Female	63 (50%)	66 (55%)
Socioeconomic status mean (<i>SD</i>) ^a	10.0 (4.2)	10.5 (4.1)
Ethnicity - <i>n</i> (%)		
Both parents Dutch	83 (65%)	79 (65%)
One or both parents other ethnicity	12 (10%)	13 (11%)
Missing data	32 (25%)	29 (24%)
Nonverbal Intelligence		
Norm score Picture arrangement (<i>SD</i>)	10.1 (3.6)	10.6 (3.4)
Norm score Block design (<i>SD</i>)	10.5 (3.1)	10.6 (3.0)
Spoken Language scores ^b		
CCC-2 Pragmatic Composite score (<i>SD</i>)	46.3 (8.7)	36.0 (9.0)
CELF Semantic relations (<i>SD</i>)	10.4 (3.9)	10.2 (2.9)
CELF Story comprehension (<i>SD</i>)	10.1 (3.8)	10.0 (3.0)

^a Socioeconomic status score was measured by parental education and occupation. ^b CCC-2, Children's Communication Checklist-2. A higher score indicates more pragmatic language problems. CELF, Clinical Evaluation of Language Fundamentals

Table 2 *Characteristics specific of DHH participants*

	DHH
Sign Language scores ^a	
ASLN Semantic relations (<i>SD</i>) (max = 5)	3.4 (1.4)
ASLN Story Comprehension (<i>SD</i>) (max = 5)	3.1 (1.6)
Mean age at onset of deafness, in years (<i>SD</i>)	1;09 (1;05)
Degree of hearing loss ^b - <i>n</i> (%)	
Moderate (40-60 dB)	29 (23%)
Severe (61-90 dB)	26 (20%)
Profound (>90 dB)	62 (49%)
Missing data	10 (8%)
Preferred mode of communication - <i>n</i> (%)	
Oral language only	96 (76%)
Sign or sign supported language	31 (24%)
Type of education - <i>n</i> (%)	
Regular education	83 (65%)
Special education	44 (35%)
Hearing Device	
Regular Hearing aid	73 (57.5%)
Cochlear Implant ^c	54 (42.5%)

^a ASLN, Assessment of Sign Language of the Netherlands. ^b Hearing losses of the DHH children were calculated by averaging unaided hearing thresholds at 500, 1000, and 2000 Hertz. ^c Mean age of implantation is 3;09 years (*SD* = 2;08; Range = 0;11 - 10;08 years); Mean duration of CI use is 8;02 years (*SD* = 2;08; Range = 2;02 - 13 years).

Materials

Friendship quality was assessed with a Best Friend Index (BFI; Kouwenberg, Rieffe, & Banerjee, 2012). The BFI consists of a positive friendship features scale (e.g., “I turn to my best friend for support with personal problems”) and a negative friendship features scale (e.g., “My friend and I bug each other”). The 20 items could be answered on a 3-point scale ranging from 1 = (*almost*) *never* to 3 = *often*. Before rating the items, participants were asked whether they had a friend. Seven hearing and twelve DHH children reported to have no best friend at Time 1. These children did not differ from children with best friends regarding gender, age, nonverbal IQ, story- and sentence comprehension, and reports of aggressive or empathic behaviors. The children who agreed to have a best friend were asked to write down the name of this best friend. This was done to discourage children from rating the items based on an internal representation of an idealized friendship. Additionally, this enabled us to examine friendship stability.

The *Empathy Questionnaire* consisted of 21 items and was designed to measure: a) Contagion, b) Personal Distress, c) Understanding, and d) Prosocial Behavior. An example item from the Understanding-scale is “When a peer cries, I often understand why”. Children were asked to rate items on a 3-point scale (from 1 = *not true* to 3 = *true*). In the current study, a mean empathy score was calculated consisting of the scales Contagion, Understanding, and Prosocial Behavior. Personal distress was not included in this mean score because the scale has an opposite direction of association with other variables.

Aggressive behavior was assessed with a self-report version of the Instrument for Reactive and Proactive Aggression (IRPA; Polman, Orobio de Castro, Koops, Van Boxtel, & Merk, 2007; Rieffe, Faber, Güroğlu, Tsutsui, & Kouwenberg, *submitted*). Children were asked to rate six possible motives (e.g., “because I was angry”) for five forms of aggressive behavior (e.g., “kicking, hitting and pushing”) on a 3-point scale (from 1 = *never* to 3 = *always*). Consequently, the total score of aggressive behavior consisted of 5 x 6 items = 30 items. A mean score over these 30 items was calculated, indicating children’s tendency to engage in overt aggressive behaviors.

All questionnaires had internal consistencies ranging from sufficient to good (Table 3). Within the DHH sample, results indicated sufficient to good internal consistency values for the spoken and sign language versions separately (ranging from $\alpha = .63$ to $\alpha = .91$).

Table 3 Psychometric properties of the questionnaires

	Range	Means (<i>SD</i>)		Cronbach's Alpha	
		DHH	H	DHH	H
<i>Friendship quality</i>					
PFF***	1-3	2.51 (.28)	2.70 (.21)	.74	.63
NFF***	1-3	1.31 (.24)	1.18 (.16)	.69	.62
<i>Social behaviors</i>					
Empathy***	1-3	2.21 (.32)	2.38 (.30)	.79	.80
Aggressive behavior	1-3	1.28 (.29)	1.25 (.23)	.92	.89

Abbreviations. DHH, deaf or hard of hearing; H, hearing children; PFF, Positive Friendship Features; NFF, Negative Friendship Features

*** $p < .001$

Additionally, indices for children's *nonverbal intelligence* were measured with two subtests of the Wechsler Intelligence Scale for Children – Third Edition (WISC-III): Block Design (copying small geometric designs with cubes), and Picture Arrangement (arranging pictures to make logical stories) (Kort et al., 2002; Wechsler, 1991). Children's raw scores were transformed to age equivalent norm scores. In a random sample of 23 DHH children, we found high associations between the present two intelligence subtest scores and previously assessed complete nonverbal intelligence scores (i.e., $r = .79$, $p < .001$). These tests were either (a version of) the WISC or the Snijders-Oomen Nonverbal Intelligence Test (Tellegen & Laros, 1993). We did not obtain IQ scores for 6 DHH and 15 hearing children.

To ensure that children have sufficient language knowledge to understand the psychosocial questionnaires, they received story- and sentence comprehension tasks. Using spoken language, hearing and DHH children received the two subtests from the Dutch version (Kort, Schittekatte, & Compaan, 2008) of the *Clinical Evaluation of Language Fundamentals® - Fourth Edition (CELF®-4)*; Semel, Wiig, & Secord, 1987). DDH children who use sign or sign supported language received the subtests from the *Assessment instrument for Sign Language of the Netherlands (ASLN)*; Hermans, Knoors, & Verhoeven, 2010). Children's language scores were converted into age-equivalent norm scores. The story-comprehension task was not administered to 6 DHH and 15 controls, and the sentence-comprehension was not administered to 13 DHH and 15 controls.

Children's *pragmatic language comprehension* was assessed to receive an indication of their linguistic abilities in real-world environments. Parents were presented with the Children's Communication Checklist-2 (CCC-2; Bishop, 1998). This

checklist contains 70 items divided over eight scales: a. speech, b. syntax, c. semantics, d. coherence, e. inappropriate initiation, f. stereotyped language, g. use of context, and h. non-verbal communication. Each item can be scored from 0 = *less than once a week (or never)* to 3 = *several times (more than 2) a day (or always)*. The pragmatic composite score is computed by summing scales e to h. A higher pragmatic composite score indicates more pragmatic language problems. We did not obtain pragmatic composite scores for 41 DHH and 35 hearing children.

Procedure

The Medical Ethics Committee of the Leiden University Medical Center granted permission for the study. DHH children were recruited from schools for the deaf and hard of hearing (both primary and secondary), ambulatory care organizations, hospitals, and by means of (social) media. The group of hearing children was recruited from primary and secondary mainstream schools. We ensured that these schools were an accurate reflection of the Dutch educational system. Written parental consent was obtained for all children prior to data collection.

Participants were individually assessed either at home or at school. Before actual data collection began, they were told their answers would be processed anonymously. Furthermore, they were made familiar with the testing procedure by an introduction and example items. All participants viewed the items one at a time in written Dutch on a laptop, with response buttons beneath on which the participants could click with a computer mouse. DHH participants who relied on sign or sign supported language viewed a video clip of the signed item in addition to the written Dutch version. A qualified sign language interpreter did translation from Dutch into sign language. Back translation showed convergence between translated and original items. Throughout data collection, a researcher was present who communicated with the DHH participants in their preferred mode of communication (i.e., spoken, sign supported or sign language). Participants could request clarification on any item from this researcher.

Statistical analyzes

Data were analyzed using the programs *Statistical Packages for the Social Sciences* version 19 and R (R development core team, 2007). In all analyzes, Friendship quality is divided in Positive Friendship Features (PFF) and Negative Friendship Features (NFF). Multivariate Analysis of Variance (MANOVA) or *t*-tests were

conducted to compare the mean levels of Friendship quality, Empathy, and Aggression between the DHH and hearing group. A three-way MANOVA was used to examine influences of (*categorical*) DHH-related characteristics (i.e., Education type, Hearing device and Communication mode) on Friendship quality. In addition to these three main effects, a possible interaction effect between Hearing device and Education type was examined.

Correlational analyzes were conducted to see which (*continuous*) DHH-related characteristics (i.e., Age at detection of hearing loss, Degree of hearing loss, Age at cochlear implantation, and Duration of CI use) were associated with Friendship quality.

We furthermore correlated Degree of Hearing loss with Friendship quality when CI children were excluded. This was done because our CI sample consists of only profoundly hearing impaired children and past research has found that CI children have more positive outcomes than profoundly hearing impaired children with a hearing aid (e.g., Theunissen, Rieffe, Kouwenberg, De Raeve, Soede, Briaire, & Frijns, 2012). Comparison of friendship quality between different friendship dyads based on hearing status was conducted with a MANOVA.

Subsequently, correlational analyzes were run to examine relations between Empathy, Aggression, and Friendship quality. Because the DHH and hearing samples differed on pragmatic language scores, and pragmatic language is important in relationships (Ninio & Snow, 1996), correlational analyzes were also carried out between pragmatic composite scores and Friendship quality, Aggression, and Empathy.

Finally, longitudinal regression analyzes with clustered bootstrap were conducted to examine whether changes in Empathy or Aggression cause changes in Friendship quality over the three measurements (Harden, 2011; Sherman & Le Cessie, 1997). The regression weights are estimated as in standard regression analysis, but the standard errors are measured by bootstrapping. This means that 10.000 samples of the same size as the total data set were drawn randomly with replacement. To deal with the dependency between measurements of the same participant, the bootstrap was clustered, i.e., individuals were sampled rather than cases so that if the individual was assessed all three times, the three measurements were included in the sample (De Rooij, 2012). In the regression models, Empathy and Aggression were split into a mean level and a change component over three measurements (Hedeker & Gibbons, 2006). The mean level is a measure of the between-participants (i.e., cross-sectional) effect of

Empathy (or Aggression) and the change component is a measure of the within-participant (i.e., longitudinal) effect of Empathy (or Aggression). The main effects of Age, Hearing status, Gender, mean Empathy score, mean Aggression score, change in Empathy, and change in Aggression on Friendship quality were tested. Interaction effects between Hearing status and Empathy (or Aggression) were included to examine whether the effect of Empathy (or Aggression) were different for DHH and hearing children. Additionally, we looked for an interaction effect between Hearing status and Age.

Results

Comparison between DHH and Hearing on Friendship quality, Empathy, and Aggression

Results of the comparison between DHH and hearing participants on PFF and NFF showed a significant multivariate effect for Group ($F(2,226) = 22.50, p < .001$, partial $\eta^2 = .17$). Univariate tests revealed that DHH score significantly lower on PFF ($F(1,227) = 30.02, p < .001$, partial $\eta^2 = .12$), and higher on NFF ($F(1,227) = 20.77, p < .001$, partial $\eta^2 = .08$).

Furthermore, DHH children scored significantly lower on Empathy than hearing children ($t(239) = 3.97, p < .001$). The two groups did not differ from each other on display of Aggressive behavior ($t(214.9), p = .33$). For all mean scores see Table 3.

Influence of DHH characteristics on Friendship quality

The three-way MANOVA showed a significant multivariate effect for Education type ($F(2,109) = 5.36, p < .01$, partial $\eta^2 = .09$). Univariate tests revealed the DHH children in Special education scored lower on PFF than DHH in Mainstream education ($F(1,110) = 7.02, p < .01$, partial $\eta^2 = .06$; $M = 2.41, SD = .28$ versus $M = 2.57, SD = .27$, respectively). In contrast, DHH in Special education scored higher on NFF than DHH in Mainstream ($F(1,109) = 4.95, p < .05$, partial $\eta^2 = .05$; $M = 1.42, SD = .26$ versus $M = 1.24, SD = .21$, respectively). No significant interaction effect between Hearing device and Education type was found ($p > .05$).

None of the continuous DHH-related variables were correlated to Friendship quality (Table 4). When children with CI were removed from the analysis, a higher Degree of hearing loss was related to more NFF.

Table 4 *Correlations between Friendship Quality and DHH-related variables*

	PFF	NFF
Age at onset of hearing loss	.09	.06
Degree of hearing loss	-.10	.07
Degree of hearing loss without CI sample	-.11	.39**
CI characteristics:		
Age at Cochlear implantation	-.06	-.02
Duration of CI use	.13	.02

** $p < .01$

Effect of Hearing status of friendship dyads on Friendship quality

Subsequently, we examined friendship quality in different dyads: a) both children DHH (DHH-DHH), b) participant DHH and friend hearing (DHH-H), c) both children hearing (H-H). A multivariate effect for dyad was found ($F(4,362) = 5.63$, $p < .001$; partial $\eta^2 = .06$). Univariate tests with Bonferroni correction revealed that the DHH-H and DHH-DHH dyads scored lower on PFF than H-H dyads. The DHH-H and DHH-DHH did not differ from each other on PFF. On the NFF, DHH-DHH dyads scored higher than H-H dyads, while DHH-H dyads do not differ from both DHH-DHH and H-H dyads (Table 5).

Table 5 *Mean Friendship quality scores of different friendship dyads*

	Range	Means (SD)		
		DHH-DHH <i>n</i> = 18	DHH-H <i>n</i> = 70	H-H <i>n</i> = 97
PFF	1-3	2.51 (.24) ^a	2.58 (.28) ^a	2.71 (.22) ^b
NFF	1-3	1.36 (.26) ^a	1.24 (.20) ^{ab}	1.21 (.22) ^b

Notes. Means differ when they do not share superscripts at the same row. DHH-DHH represents DHH dyad, DHH-H represents a DHH child and a hearing friend, H-H represents hearing dyad.

Friendship Stability over time

Children indicated their best friend by name for each wave, which enabled us to exploratively study friendship stability. Friendship stability could be explored for 79 DHH and 103 hearing participants over the first two data collections and for 64 DHH and 80 hearing participants over all three waves. Results showed that 42% ($n = 33$) of the DHH sample and 50% ($n = 52$) of the hearing sample had the same best friend the first two consecutive waves. In both DHH and hearing

children, about one fourth ($n = 15$; 23%, and $n = 21$; 26%, respectively) had the same best friend over three waves.

Correlational analyzes

PFF were positively related to Empathy, whereas PFF were negatively related to Aggression (Table 6). The relations of NFF with Empathy and Aggression were in the opposite direction as for the PFF. Pragmatic composite scores (in which a higher score represents more problems) were negatively related to PFF and Empathy in both groups (Table 6). Because, first, there were no relationships between Pragmatic composite scores and Aggression and NFF, and second, partialling out for Pragmatic language scores did not alter the relation between Empathy and PFF ($r = .44$, $p < .001$); the pragmatic scores were not included in the regression analyzes.

Table 6 *Correlational analyzes at Time 1*

	PFF	NFF	CCC-2 pragmatic score
Empathy	.43***	-.20**	-.17*
Aggression	-.22**	.35***	.08
CCC-2 pragmatic score	-.27**	.11	-

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7 *Longitudinal regression analyzes between Empathy, Aggression and Friendship quality*

	PFF			NFF		
	R^2	B	[95% CI] ^a	R^2	B	[95% CI]
	29.4%			14.5%		
Hearing status ^b		-.10*	[-.16 - -.05]		.07*	[-.02 - .11]
Gender ^c		.08*	[-.02 - .13]		.02	[-.02 - .07]
Age ^d		.002*	[.001 - .003]		-.001	[-.002 - .000]
Mean Empathy		.30*	[-.20 - .40]		-.01	[-.10 - .007]
Mean Aggression		-.08	[-.21 - .04]		.34*	[-.22 - .45]
Change in Empathy		.17*	[-.08 - .26]		-.02	[-.10 - .06]
Change in Aggression		-.07	[-.20 - .06]		.14*	[-.002 - .28]

^a CI = Confidence Interval. Significance is reached when the 95% CI does not include zero. ^b 0 = hearing, 1 = DHH. ^c 0 = boys, 1 = girls. ^d Raw scores are used in these analyzes. Age is in months, meaning that by every month children grow older; their PFF value increases with .002.

Longitudinal regression analyzes

For PFF, results showed significant effects of Hearing status, Gender, Age, mean Empathy score, and change in Empathy (Table 7). For NFF, results revealed

significant contributions of Hearing status, mean Aggression score, and change in Aggression. We also explored a just significant interaction effect between Hearing status and Age for NFF ($B = -.002$, 95% CI $[-.004 - .000]$), which indicated that the difference on NFF between hearing and DHH decreases with age.

Discussion

The current study revealed that DHH children reported lower friendship quality than hearing children. This means that DHH children reported more negative friendship features (e.g., conflicts) and less positive features (e.g., companionship) than hearing children. Fortunately, we found that the difference regarding negative friendship features between DHH and hearing children became smaller with increasing age. Furthermore, for DHH children, it did not matter whether they had a DHH or hearing friend; the main variable that caused variability in friendship quality within the DHH sample was the type of education children attend. DHH in special schools had lower friendship quality than DHH in mainstream schools. Finally, friendship stability was equal in DHH and hearing children, as were the (longitudinal) associations between friendship quality and social behaviors. In both groups, a change in empathic behavior caused a change in positive friendship features and a change in aggressive behavior caused a change in negative friendship features. In this respect, for both DHH and hearing children, increasing their empathic skills and decreasing their aggressive behavior can improve their friendship quality.

The low friendship scores DHH children in special education reported, might reflect the more general problems these children experience, i.e., problems that placed them into special education in the first place (Fellinger, Holzinger, & Pollard, 2012; Van Gent et al., 2007). This was underscored by our observations that these DHH children in special education experienced more pragmatic language ability problems, showed fewer empathic-, but more aggressive behavior than DHH in mainstream education. This pattern remained regardless of the type of hearing device DHH children have.

In the ever present discussion whether the use of sign (supported) language hinders DHH children in their development, the current results support the assumption that it would not (for friendship quality at least). We explored the main effect of education type when correcting for communication mode, and vice

versa. So, although children using sign (supported) language may score lower on the negative friendship features than children using spoken language, the effect is absent when education type is taken into account. This result emphasizes exploration of these effects simultaneously, because separate analyzes may not isolate the actual main effect.

Furthermore, a higher degree of hearing loss was associated with more negative features within a friendship. An increased hearing loss may be associated with more misunderstandings by DHH children, and in turn, frustration within the friendship may increase (Leigh, Maxwell-McCaw, Bat-Chava, & Christiansen, 2008). Yet, this was only found when CI children were excluded from the analysis. Our complete CI sample was profoundly hearing impaired, because cochlear implantation used to be performed only on individuals with a profound hearing loss. An implant generally provides more access to sound (e.g., speech perception) than is accessible to most profoundly hearing impaired children with conventional hearing devices (e.g., Meyer, Svirsky, Kirk, & Myamoto, 1998). In future studies, the effect of the functional limitations of hearing loss of the total group of DHH children (both children wearing CI as those wearing a conventional hearing device) could be explored.

The fact that age at implantation and duration of CI use were not related to friendship quality is possibly attributable to the relatively high mean scores and wide ranges of both of these aspects. McConkey Robbins, Burton-Koch, Osberger, Zimmerman-Philips, and Kishon-Rabin (2004) found that when age at implantation increased; it became harder to predict outcomes after the implantation. Because the majority of CI children nowadays receive their implant at an early age, the range will automatically become smaller. The influence of the CI characteristics can be explored in future studies.

Both DHH and hearing children had relatively unstable friendships within a timeframe of 1.5 years. Only 23% of the DHH and 26% of the hearing children were having the same friend over three waves. This also means that the changes in friendship quality over time were often not within the same friendship. However, how children experience their friendship could be viewed as a characteristic of the child and relatively stable across friendships. This is supported by past results of consistency in friends' behavior across friendships (Güroğlu, Cillessen, Haselager, & Van Lieshout, 2012). Friendship instability during late childhood and early adolescence is not uncommon. One-third to one-half of friendships is unstable (Bowker, 2004; Chan & Poulin, 2007). At first, the similarity in

friendship stability between DHH and hearing children contradicts Lederberg and colleagues (1987), who reported DHH children to have less stable friendships than hearing children. Yet, these prior results were based on observations of interactions between preschoolers and therefore, both on developmental and methodological levels, different from the current study. This makes our study the first to examine friendship stability in DHH individuals during late childhood and early adolescence.

No difference was found between DHH and hearing individuals on language abilities (i.e., sentence and story comprehension), which opposed findings of DHH children to experience language problems (see Musselman, 2000, for review; Traxler, 2000). The good results on the current language comprehension tasks are likely caused by the fact that two different assessment tools were used. DHH children who used sign language were not tested with the CELF®-4, while particularly this group of signing children is expected to experience (spoken) language problems. The methodology of using two different assessment tools supported our goal of examining children's comprehension of the language in which they received the psychosocial questionnaires. However, the language tests may not reflect children's language abilities to interact with the (overall hearing) surrounding. In fact, DHH children were found to score lower on the ability to use language effectively in interpersonal situations (i.e., pragmatic language use). Lower pragmatic language skills were related to less empathy and less positive friendship features. The pragmatic language skills did not alter the relationship between empathy and positive friendship features, but future studies could examine this skill more closely in DHH children's social interactions.

Future research

In the present study, the subjective and one-sided (as opposed to reciprocal) experiences of friendship were examined because these components are found to be particularly influential for children's behavior and adjustment (Aloise-Young, Graham, & Hansen, 1994; Poulin & Chan, 2010). Yet, we do not know whether the friendships were reciprocal or the objective quality of the friendships. This can be established by investigating also the friends' perspective and reciprocity of friendships in future research. Furthermore, relationally aggressive behavior (i.e., nonphysical behaviors that damage peer relationships) can be seen as more sophisticated than blunt overt aggressive behavior. This behavior requires

more social understanding and, therefore, may be differently associated with friendship quality in DHH compared to hearing peers. Future research could examine relationally aggressive behavior in DHH children as compared to their hearing age-mates. Finally, our sample of dyads of two DHH friends was small with $n = 18$. A research sample that includes more of these dyads in future research would allow examination of relations between social behaviors and friendship quality in the various dyads.

Conclusion

Particularly a high quality, best friendship has been found significant for individuals' mental health (La Greca & Harrison, 2005). The present results revealed that DHH children reported lower friendship quality than their hearing age-mates. Fortunately, friendship quality can be enhanced by decreasing children's aggressive and increasing their empathic behaviors. This accounts for both DHH and hearing children. So, for children who experience problems in their friendships, prevention and intervention programs can focus on improving these children's social behaviors.



Chapter 8



Discussion



“The outcomes showed higher levels of self-reported depression in the DHH than in the hearing sample.” (Chapter 4 this thesis, p. 63)

“DHH children reported fewer invitations to parties, received more mean comments, and being more often ignored than hearing children.” (Chapter 5 this thesis, p. 98)

“DHH children reported lower friendship quality, but equal friendship stability as compared to hearing children.” (Chapter 7 this thesis, p. 117)

The above statements indicate that the current research on internalizing problems and peer relations of children and adolescents who are deaf or hard of hearing (DHH) was grounded. Even though past studies found elevated levels of psychosocial difficulties in DHH children as compared to hearing children (e.g., Dammeyer, 2010; Fellingner, Holzinger, & Pollard, 2012; Hintermair, 2006), a lot remained unknown. We particularly knew little about the underlying social-emotional factors, and children's own perceptions thus far. The goal of this thesis was to enhance our understanding about internalizing problems and peer relations in a large sample of DHH youth. This was done along the principles of the developmental psychopathology framework in which DHH children were compared to hearing counterparts and in which multiple (underlying) social-emotional factors were examined.

In this research, DHH children reported a higher prevalence of depressive symptoms as compared to hearing children (chapter 4), similar to previous findings (e.g., Konuk, Erdogan, Atik, Ugur, & Simsekyilmaz, 2006). A positive finding was that DHH and hearing children reported an equally (low) prevalence of somatic complaints (chapter 3). Regarding peer relations, DHH youth reported lower friendship quality, and some forms of victimization more often than their hearing peers (chapter 5 and 7). These particular victimization forms included feelings of being ignored and receiving fewer invitations to parties than hearing children. This underscores past findings of DHH children to feel more neglected and more alone than hearing children (e.g., Kent, 2003; Nunes, Pretzlik, & Olsson, 2001).

Exploration of the underlying factors revealed no differences between DHH and hearing children on emotional functioning. That is, DHH and hearing children reported equal mean levels of emotional awareness and of the various mood states (i.e., anger, sadness, fear, and happiness) (chapter 3, 4 and 5). Differences between

the groups were predominantly found regarding underlying factors from the social functioning domain, meaning that DHH children showed lower Theory of Mind abilities (chapter 4) and less empathy (chapter 7) than hearing children. These findings support the general conclusion of Kluwin, Stinson, and Collarissi (2002) that DHH children are socially less mature than hearing children.

Yet, no difference between the two groups of children was reported on overt aggression (chapter 7). This behavior was also viewed as a social factor, provided that it entailed aggressive acts towards other children. However, this equal score on aggression should be slightly nuanced, as a related study with the same sample did find DHH children to report one particular form of aggression more often than hearing children, i.e., proactive aggression⁴ (Theunissen, Rieffe, Kouwenberg, De Raeve, Soede, Briaire & Frijns, *submitted*). All in all, these findings highlight the importance of carefully exploring and reporting about DHH children's functioning within various domains (e.g., different forms of internalizing problems) or even within a form (e.g., different forms of being victimized), rather than catching their functioning in overall terms as 'problematic' or 'not problematic'. Also refer to Table 1 for an overview of the (dis) similarities in mean prevalence scores.

If we add up all these findings, the list of similar mean scores between DHH and hearing children is actually longer than the list of dissimilar mean scores. Furthermore, the dissimilarities were found mainly regarding peer relations and the underlying factors coming from the social functioning domain, and not the factors coming from the emotional functioning domain. It should be noted that these results were based on the complete samples of both groups of children. Exploration of subsamples of DHH children showed that some of them were doing less well than others. This will be addressed in more detail in the next section.

Moreover, while some mean prevalence scores were equal, associations between internalizing problems, peer relations and their underlying social-emotional factors differed for DHH children as compared to their hearing age-mates. Knowledge about these different associations has large potential for improvement of prevention- and intervention programs. This knowledge provides the possibility to develop DHH 'custom-made' programs. Before we focus on the associative patterns between internalizing problems, peer relations,

4 Proactive aggression is viewed as planned and instrumental in order to intimidate others or dominate social interactions. This is opposed to reactive aggression, which is seen as a defense mechanism against provocation, frustration or threat (Dodge & Coie, 1987).

and social-emotional factors, the influence of DHH-related characteristics on DHH children's functioning will be summarized and discussed.

Table 1 (Dis)similarities between DHH and hearing children on mean prevalence scores

Chapter	Social-Emotional factors	Internalizing problems	Peer relations
3	Mood states	(DHH = H)	Somatic complaints (DHH = H)
	Sense of coherence	(DHH = H)	
4	Emotion awareness	(DHH = H)	Depressive symptoms (DHH > H)
	Self-esteem	(DHH = H)*	
	Theory of Mind	(DHH < H)	
	Delinquency	(DHH = H)	
	Victimization	(DHH = H)*	
5	Mood states	(DHH = H)	Victimization (DHH = H)*
	Parental behaviors	(DHH ≠ H) ^a	
7	Empathy	(DHH < H)	Friendship quality (DHH < H)
	Aggression	(DHH = H)*	

* On composite scores no mean differences were found between DHH and hearing children, but on specific forms or specific scales mean differences were found. On self-esteem these differences came from research with the same sample (Theunissen, Rieffe, Briaire, Soede, Kouwenberg, & Frijns, submitted).

^a Parental sensitivity (both parent-report and child-report), Parents' expectations and Parental Emotional Intelligence were assessed. Differences in mean scores were found on child-reported Parental sensitivity.

Characteristics of DHH children and adolescents

Throughout this thesis, a recurring DHH-related characteristic causing variability in DHH children's functioning was **type of education** (i.e., special or mainstream). DHH children who were educated in special schools reported more symptoms of depression, more occurrences of victimization, and a lower friendship quality than DHH children in mainstream schools. Furthermore, DHH children in special schools reported less happy mood, less empathic concern, and more aggressive behavior than DHH children in mainstream schools. So, DHH children in special schools showed more internalizing-, peer relation-, and social-emotional difficulties than DHH children in mainstream schools. Wolters, Knoors, Cillessen and Verhoeven (2011) recently reported similar differences between DHH children in special schools and DHH children in mainstream schools. This does not indicate that special education impedes DHH children in their functioning. It could as well be that the problems these DHH children experience placed them into special schools, while those DHH children who

are achieving well are educated in mainstream schools (Fellinger et al., 2012; Van Gent, Goedhart, Hindley, & Treffers, 2007). DHH children's functioning could therefore be viewed as being at the root of educational placement. Moreover, many of the problems mentioned are interrelated. For instance, less emphatic concern and more aggressive behavior caused lower friendship quality (chapter 7). So, these children in special schools are experiencing a network of difficulties, many of which affect each other.

It should be noted that the current findings that DHH children in special education are victimized more often than DHH children in mainstream education, appear to contradict past findings that DHH children in special schools have more positive peer experiences than DHH in mainstream schools (cf. Stinson & Kluwin, 2011). In the present study, children's peer relations within all environmental contexts were explored, i.e., not exclusively on school grounds. It may well be that DHH children in special schools are a target for victimization outside school in their own neighborhood. Future studies can unravel this by making a distinction between peer relations within schools or outside of schools. Results of previous studies were inconclusive, or even contradictory, about the relation between DHH children's preferred **communication mode** (i.e., sign, sign supported or spoken language) and their psychosocial functioning (e.g., Kushalnagar, Topolski, Schick, Edwards, Skalicki, & Patrick, 2011; Polat, 2003; Van Gent et al., 2007; Stevenson, McCann, Watkin, Worsfold, & Kennedy, 2010). For the majority of internalizing problems, peer relations and their underlying factors explored in this thesis (except for fear feelings), DHH children's preferred communication mode did not have an influence. This result was obtained when we controlled for other DHH-related characteristics, such as type of education. When the influence of communication mode was examined without other DHH-related characteristics, or when only fear feelings were examined, we could have spuriously concluded that the use of sign (supported) language was having an (negative) influence on DHH children's functioning. This underscores the importance of the developmental psychopathology principle (#2) of examining multiple factors and outcomes to avoid false generalizations (Cicchetti & Toth, 2009). Noteworthy to mention is that this finding pertains mainly to children using sign *supported* language, because only two children in this study preferred to use sign language. To conclude, for the majority of findings in this thesis, sign supported language did not have an influence on DHH children's functioning over and above other DHH-related characteristics, like education type.

The effect of **type of hearing device** (i.e., cochlear implant or conventional hearing device) on DHH children's internalizing problems and peer relations requires some consideration. The children with a cochlear implant (CI) included in the current research all had profound hearing loss⁵. When this group of profoundly hearing impaired children with CI was compared to a group of profoundly hearing impaired children with conventional hearing devices, the former attained better psychosocial outcomes than the latter (Theunissen et al., 2012). Thus, when CI children were matched on degree of hearing loss with children with conventional hearing devices, CI children appeared to reach better adjustment scores.

In the studies comprising this thesis, children with CI were compared to the complete sample of children with conventional hearing devices (i.e., those with moderate to profound hearing loss). These two groups reported equal scores on internalizing problems and peer relations. Additionally, no sample differences were reported on mood states and sense of coherence. Though, because profoundly hearing impaired children with CI function better than profoundly hearing impaired children with conventional hearing devices, CI does appear to aid DHH children in their functioning.

Furthermore, the absence of a difference between children with CI and children with conventional hearing devices in the studies reported in this thesis could also be due to the fact that our CI sample is generally implanted late (mean age of almost four years). Past research has found that the prediction of post-implantation outcomes becomes harder when age at implantation increases (McConkey Robbins, Burton-Koch, Osberger, Zimmerman-Philips, & Kishon-Rabin, 2004). Additionally, it has been reported that children go through a sensitive period at which cochlear implantation should take place to improve children's (language) functioning (see Ganek, McConkey Robbins, & Niparko, 2012, for review). A recent study found this period to end when children reach the age of two years (Boons et al., 2012), which is much earlier than our sample's mean age of four years. Future studies will automatically include a sample of CI children that is implanted at an earlier age, because nowadays children are usually implanted before the age of two (De Raeve, 2010).

5 Cochlear implantation used to be performed only on individuals with a profound hearing loss, but recently the inclusion criteria have been expanded and also children with severe hearing losses are eligible for the procedure.

Finally, in the current studies, DHH children with a higher **degree of hearing loss** were not found to experience more internalizing or peer relation problems as compared to DHH children with a lower degree of hearing loss. This is in line with the majority of findings reported previously (Antia, Jones, Luckner, Kreimeyer, & Reed 2011; Dammeyer, 2010; Stevenson et al., 2010). There is, however, a pitfall when examining links between degree of hearing loss and psychosocial functioning. Children's degree of hearing loss measured *without* their hearing devices differs from their degree of hearing loss *with* their hearing devices. In this research, the unaided (i.e., *without* hearing device) hearing thresholds were used. Only from a minority of the sample ($n = 34$; about $\frac{1}{4}$ th of the group of DHH children), the aided hearing thresholds were known. This number was too small to use in analyzes. Future studies should include children's aided degree of hearing loss to provide a more accurate measure of their everyday level of hearing loss. Also recall the finding that children who are profoundly hearing impaired (unaided), functioned differently depending on the type of hearing device they were wearing (i.e., a CI or a conventional hearing device). Furthermore, children's speech perception is an important aspect of their daily hearing. Speech perception is a vital channel through which children connect with their social surrounding, and could therefore be an important factor to focus on in future psychosocial research.

In sum, DHH-related aspects should be explored, both in-depth and simultaneously, to unravel their actual influences on DHH children's internal states, peer relations and social-emotional functioning. In the current research, education type appeared to be the foremost characteristic related to dissimilarities regarding DHH children's internalizing problems, peer relations and social-emotional functioning.

Methodological strengths of this research

Besides exploration of DHH-related characteristics causing variability within the DHH sample, this research explored differences between the complete samples of DHH and typically developing, hearing children. This was based on the (#1) principle of the developmental psychopathology framework to examine both atypically and typically developing samples. As not all DHH children could be presented with self-report questionnaires in an equal manner as hearing

children, various methodological considerations were taken into account (chapter 2). For example, it was ensured as much as possible that both the grammar of the items as the semantic structures (e.g., excluding items concerning sounds) were appropriate for the DHH participants. Adaptations that were made to testing materials for DHH participants were also carried through in testing materials for hearing participants. Additionally, items were translated from Dutch into Sign Language of the Netherlands (SLN) for those DHH participants who preferred to use sign (supported) language. Overall, this resulted in satisfactory psychometric properties of the questionnaires for both the DHH and hearing samples. Satisfactory psychometric properties, in turn, are a prerequisite for reliable and valid findings.

The differences between DHH and hearing children regarding mean scores of internalizing problems, peer relations, and social-emotional factors have been addressed previously in this discussion. However, a focal point of attention in the studies included in this thesis, and one which made this research original compared to earlier research, was to go beyond mean difference scores and consider possible group differences in social-emotional pathways leading to internalizing problems and peer relations. This approach of studying children's functioning on a process level was principle #3 of the developmental psychopathology framework. The studied associations between internalizing problems, peer relations and their underlying social-emotional factors were based on theoretical models adapted from research with hearing children (e.g., Denham et al., 2003; Zeman, Shipman, & Suveg, 2002). In the next section, the key findings concerning the underlying factors of internalizing problems and peer relations in DHH children as compared to hearing children will be discussed.

Factors underlying internalizing problems and peer relations

A first key finding was that **emotional (dys)functioning** is an important factor underlying the development of internalizing problems and peer relations in both DHH and hearing children. In other words, in the current thesis we found the associations between emotional (dys)functioning and internalizing problems and peer relations in DHH children to be comparable to those in hearing children. A second key finding of the studies included in this thesis was that the influence

of social factors on children's internalizing problems and peer relations caused a discrepancy between DHH and hearing children. DHH children's poor **social understanding** (i.e., Theory of Mind) was uniquely related to the development of depressive symptoms. This relation was not found in the hearing sample (chapter 2). DHH children's lower social understanding has been reported repeatedly in past research (e.g., Meristo & Hjelmquist, 2009; Peterson & Wellman, 2009; Peterson, Wellman, & Slaughter, 2012). The fact that this form of social understanding directly affects DHH children's internalizing problems is, to the best of our knowledge, a new finding; one that should receive more attention in future research.

Furthermore, the social factor '**parental behavior**' was differently related to victimization in DHH children when compared to hearing children (chapter 7). DHH children, whose parents had higher expectations concerning their competencies, and parents who were sensitive to their DHH children's needs, were less prone to be targets of victimization. In hearing children, these relations between parental behaviors and victimization were more complex or absent.

This association between parental behavior and DHH children's functioning requires some additional discussion on its interpretation. Parental sensitivity in the current thesis was assessed from both parents' and children's perspectives. The parental sensitivity from children's perspectives can be interpreted as a more *reactive* parenting style, because this refers to, for example, children turning to their parents to discuss their problems. Parents who scored high in this domain of parental sensitivity also scored high on being sensitive to their children's communicative needs (e.g., to look at their child before starting to communicate), which underscored that parents behave in reaction to their children.

In turn, the parental sensitivity from parents' perspectives can be interpreted as a more *directive* parental behavior, in which the parents take the initiative to turn to their children. Past studies frequently mentioned the directive parenting style of hearing parents of DHH children (cf. Vaccari & Marschark, 1997; Quittner et al., 2010), but this was predominantly based on research with preschoolers, while findings on young adolescents were lacking. Furthermore, directive parenting frequently has a negative undertone, implying that parents are not responsive or sensitive to their children. However, it has also been proposed that some directive parenting behaviors are, in fact, an appropriate adaptation to DHH children's linguistic development (Lederberg & Everhart, 2000). In the current thesis, parental directivity appeared adaptive for DHH children's peer

relations. In sum, in this thesis both directive as well as reactive parenting behaviors were found to be functional for DHH children when they are in their early teens.

Practical implications

An evident question following the current research on DHH children's internalizing problems and peer relations, is how the results can be translated into practice. In this perspective, the peer relations and social understanding of DHH children should receive focal attention. For example, while normally hearing children acquire the Theory of Mind abilities we addressed in chapter 4 of this study around the age of 4 or 5 (e.g., Wellman, Cross, & Watson, 2001), our DHH sample aged between 9 and 16 years still faced difficulties with regards to these abilities. Moreover, these abilities were related to children's friendships and their mental health (i.e., depressive symptoms), which underscores the need to boost DHH children's social understanding.

Children's social abilities could be enhanced through specific programs (e.g., Providing Alternative THinking Strategies or PATHS; Greenberg & Kusché, 1993). Parents and teachers (in special education) could also make a habit of explicitly mentioning the thoughts behind their behaviors. Previously it has been suggested that individuals acquire language / knowledge the 'easiest' when others explicitly mention what they are doing during an activity or in their daily routines (Pike, 1989). Performing an action and, at the same time, naming the action appeared to be better absorbed and remembered than, for example, reading a book together. This is also a principle of the 'The Hanen' program (cf. Girolametto & Weitzman, 2007), in which daily activities between parents and their children are used to enhance the communication and language skills of children. The 'The Hanen' program was developed to improve children's (aged up until five years) communicative skills, or the social skills of children with autism spectrum disorder. This way of incidentally, yet purposely, acquiring knowledge during interactions between parents and children can be expanded to the acquisition of social abilities by DHH children, specifically when they are in their teens.

Furthermore, family-counseling programs in the Netherlands could be expanded to include parents of young adolescents. Parents of DHH children

receive sign (supported) language courses and support with raising a DHH child until their children are five or six years of age. Because the current results show that parental behaviors are directly linked to children's victimization and children's negative mood states⁶, and previous research has shown that DHH adolescents' self-esteem was positively associated with home communication (Leigh, Maxwell-McCaw, Bat-Chava, & Christiansen, 2008; Van Gent, Goedhart, Knoors, Westenberg, & Treffers, 2012); parents should be able to receive support when children are in their (early) teens. Parents of older DHH children may be offered to attend parent evenings and workshops, and meetings in which personal counseling on raising a DHH adolescent can be provided.

For DHH children in special education, the role of teachers should not be underestimated. Wolters and colleagues (2012) found that the relationship between students and their teachers is an important factor regarding DHH children's well-being. Because in the current research, particularly DHH children in special education were found to experience most problems, teachers could play a key role in their adjustment. Moreover, as social-emotional development is also an important determinant of academic development (cf. Zins, Weissberg, Wang, & Walberg, 2004), children's social-emotional functioning is an area that requires sustained attention in education programs.

Future research

One research project often forms the base for subsequent research projects, and findings from the current thesis also inspired future research ideas. Many of these ideas have been provided in each chapter and throughout this discussion. A returning, yet very important, direction for future research is that associations should be explored over time. This way of analysis would provide the opportunity to unravel causal directions of associations.

Furthermore, in the current research, a strong relationship was found between parental sensitivity and communication between DHH children and their parents. Past results revealed that communication at home was strongly related to DHH children's self-esteem and satisfaction with life (Leigh et al., 2008; Van Gent et al., 2012). Other studies showed that sharing the same language

⁶ More parental sensitivity was related to less anger and less sadness in chapter 5.

(Wallis, Musselman, & MacKay, 2004), or more specifically the communicative competence of parents and children in that shared language (Hintermair, 2006; Kushalnagar et al., 2011), is important for DHH children's development. So, communication between DHH children and their parents appears to play an important role for children's development, but a lot remains unknown to date. For example, how does home communication influence parental behaviors and (in turn) children's functioning in a wide range of domains? Or, how is home communication related to other domains of children's functioning, besides self-esteem and satisfaction of life? Future multi-informant and multi-method research may unravel these questions in DHH children when they reach late childhood and early adolescence.

In the current research, children's functioning was assessed by means of self-report questionnaires, as this is the recommended method for examination of youth's (subjective) internal processes (Betts, Gullone, & Allen, 2009). Yet, knowledge about children's functioning experienced by others is lacking. These other-reports would result in an overall picture of children's functioning. For example, self-reports mostly reflect subjective experiences; whereas peer-reports reflect more of an individual's social reputation (Juvonen, Nishina, & Graham, 2001). Divergence between self- and other-reports has also been shown in the current study on parental behaviors; i.e., child-reports revealed a difference between parents of DHH children and parents of hearing children, whereas parent-reports did not. To provide the most complete picture of children's (but also parental and peers') functioning, future research could include both self-reports and other-reports.

Related to this self-report methodology is the fact that we failed to find a difference regarding mean scores of emotional functioning in DHH children as compared to their hearing counterparts. The high interrelations between negative mood states, such as fear and anger (chapter 3 and 7) did indicate, however, that DHH children experience problems differentiating between emotions within the negative domain (also refer to Rieffe, 2012). Because self-report questionnaires may be less able to reveal emotional difficulties in DHH children, future research on DHH children's emotional functioning could include other methodologies, such as experiments and observations.

Highlight of the research

A frequently asked question in a research project concerns its highlight(s). Although generalizations must be made with caution, as the present findings varied according to different forms of functioning or different subsamples explored, a general pattern (or highlight) can be identified. This is that DHH children differed most from their hearing peers in aspects or associative patterns that involved a social facet. However, at a deeper level, also problems with emotional functioning became apparent. It is of the utmost importance to examine DHH children's functioning thoroughly, and to take - besides the mean scores - associative patterns into account.



Dutch Summary /
Nederlandse Samenvatting

Inleiding Ongeveer 1 op de 1000 kinderen wordt doof of slechthorend (D/SH) geboren (Korver, Konings, Dekker, Beers, Wever, Frijns, & Oudesluys-Murphy, 2010; Watkin & Baldwin, 2011) en gedurende de kindertijd verdubbelt dit aantal bijna (Fortnum, Summerfeld, Marshall, Davis, & Bamford, 2001; Watkin & Baldwin, 2011). Eerder onderzoek heeft aangetoond dat D/SH kinderen en jongeren meer internaliserende problemen (bijvoorbeeld depressieve symptomen) en problemen in relaties met leeftijdsgenoten ervaren dan normaal horende kinderen en jongeren (e.g., Remine & Brown, 2010; Van Eldik, Treffers, Veerman, & Verhulst, 2004; Wolters, Knoors, Cillessen, & Verhoeven, 2011). Toch is er nog veel onbekend over deze problematiek, bijvoorbeeld over de onderliggende factoren en de eigen percepties van D/SH kinderen en jongeren. Het doel van dit proefschrift was om de kennis over internaliserende problemen en de relaties met leeftijdsgenoten van D/SH kinderen en jongeren⁷ tussen de 9 en 16 jaar oud te vergroten.

In **hoofdstuk 1** worden de methodologische en theoretische kaders uitgelegd die de basis vormden voor de onderzoeken in dit proefschrift. Het ‘developmental psychopathology framework’ (Cicchetti & Toth, 2009; Cummings, Davies, & Campbell, 2000) vormde het methodologische kader van het onderzoek. Dit houdt in dat naast het onderzoeken van de prevalentie (i.e., gemiddelden) in D/SH kinderen in vergelijking met normaal horende kinderen, de nadruk lag op verklarende factoren die bijdragen aan (of juist beschermen tegen) internaliserende problematiek en relaties met leeftijdsgenoten. De onderzochte verklarende factoren waren gebaseerd op theoretische modellen verkregen van onderzoek met normaal horende kinderen. In die modellen spelen emotionele en/of sociale factoren een belangrijke rol in de ontwikkeling van internaliserende problematiek en de relaties met leeftijdsgenoten (e.g., Denham et al., 2003; Pritchard & Woollard, 2010; Zeman, Shipman, & Suveg, 2002).

Tevens wordt in hoofdstuk 1 de heterogeniteit van de groep D/SH kinderen omschreven. D/SH kinderen kunnen bijvoorbeeld verschillen in type school waar ze worden onderwezen (regulier of speciaal onderwijs), type hoortoestel (cochleair implantaat⁸ of conventioneel hoortoestel), en/of mate van gehoorverlies

⁷ In het vervolg van deze samenvatting zal er naar deze groep van kinderen en jongeren gerefereerd worden als kinderen.

⁸ Een cochleair implantaat is een implanterbare gehoorprothese. Tegenwoordig krijgt ongeveer 95% van de jongeren die ernstig of doof geboren worden een cochleair implantaat.

(matig, ernstig/zwaar slechthorend, of doof). Aan de hand van eerdere literatuur worden de invloeden van deze zogenaamde 'D/SH-gerelateerde' factoren op het welzijn van D/SH kinderen uitgelegd.

In de empirische studies die worden beschreven in dit proefschrift is voornamelijk gebruik gemaakt van zelfrapportage vragenlijsten. Dit is gedaan omdat kinderen vanaf hun achtste jaar steeds beter in staat zijn om over hun eigen functioneren te oordelen (Harris, 1989). Daarnaast blijven veel gevoelens en gedachten van een kind, net als de omgang met leeftijdsgenoten, onopgemerkt voor ouder(s)/verzorger(s) (Keller, Lavori, Beardslee, Wunder, & Ryan, 1991). Dit kan een nog groter probleem zijn tussen horende ouders en hun D/SH kinderen door mogelijke communicatie barrières (Preisler, Tvingstedt, & Alström, 2002). Er zijn een aantal facetten waar rekening mee moet worden gehouden in het aanbieden van zelfrapportage vragenlijsten aan D/SH kinderen. Deze facetten worden omschreven in **hoofdstuk 2**. Dit hoofdstuk vormt de basis voor de studies over internaliserende problemen en de relaties met leeftijdsgenoten van D/SH kinderen die in hoofdstuk 3, 4, 5, en 7 worden besproken.

In **hoofdstuk 3** van dit proefschrift zijn *somatische klachten* als eerste vorm van internaliserende problematiek onderzocht. Somatische klachten zijn lichamelijke klachten, zoals buikpijn, hoofdpijn en duizeligheid, die geen duidelijke medische oorzaak hebben. De resultaten van het huidige onderzoek lieten zien dat deze vorm van internaliserende problematiek even vaak voorkwam bij D/SH kinderen als bij normaal horende kinderen. Daarnaast hadden de D/SH-gerelateerde variabelen (bijvoorbeeld type onderwijs of type hoortoestel) geen invloed op de prevalentie van somatische klachten.

De resultaten toonden tevens aan dat somatische klachten in D/SH kinderen deels veroorzaakt worden door emotionele factoren, zoals langdurige negatieve stemmingen (woede en angst) die op den duur hun tol eisen van het lichaam. Dit verband was hetzelfde als in horende kinderen. Daarnaast werd in beide groepen gevonden dat kinderen die weinig controle ervaren over negatieve situaties (een lage 'sense of coherence') eerder lichamelijke klachten ontwikkelen dan leeftijdsgenootjes die wel controle ervaren. Tot zo ver leek de ontwikkeling van somatische klachten hetzelfde in D/SH als in normaal horende kinderen. Echter, een opvallend verschil was dat angst bij D/SH kinderen een grotere rol speelde in de ontwikkeling van de klachten dan bij de normaal horende kinderen, terwijl blijdschap minder een beschermende factor bleek te zijn.

Nadere analyses toonden aan dat dit verklaard kon worden door de relaties tussen de stemmingen onderling. In de discussie van hoofdstuk 3 wordt dit verder uitgelegd en bediscussieerd.

In **hoofdstuk 4** worden *depressieve symptomen* als tweede vorm van internaliserende problematiek besproken. Depressieve symptomen worden gekarakteriseerd door aanhoudende gevoelens van anhedonie, verdriet of wanhoop. De resultaten van het huidige onderzoek lieten zien dat D/SH kinderen meer depressieve symptomen rapporteerden dan normaal horende kinderen.

Aan de hand van eerder onderzoek met normaal horende kinderen (Rieffe & De Rooij, 2011) werd emotioneel bewustzijn als onderliggende emotionele factor van depressieve symptomen onderzocht. Emotioneel bewustzijn verwijst naar het vermogen om emoties te herkennen, om te kunnen differentiëren tussen verschillende emoties en het begrip wat een bepaalde emotie veroorzaakt (Rieffe, Oosterveld, Miers, Meerum Terwogt, & Ly, 2008). De resultaten lieten zien dat emotioneel bewustzijn in zowel D/SH kinderen als horende kinderen bijdragen aan depressieve symptomen.

Tevens werden onderliggende sociale factoren onderzocht. Dit was gebaseerd op eerdere bevindingen dat D/SH kinderen juist veel sociale problemen ervaren, en op de theorie waarin sociaal (dis)functioneren als belangrijke factor in de ontwikkeling van kinderen wordt gezien (Pritchard & Woollard, 2010). De resultaten lieten inderdaad een verschil zien tussen D/SH en horende kinderen wat betreft de invloed van een sociale factor op depressieve symptomen. Sociaal begrip (i.e., Theory of Mind⁹) was een verklarende factor voor depressieve symptomen in D/SH kinderen en niet in normaal horende kinderen. Samenvattend droegen de onderzochte emotionele factoren bij aan depressieve symptomen in zowel D/SH als horende kinderen, maar verschilden de groepen in de bijdrage van sociaal begrip op depressieve symptomen.

In **hoofdstuk 5** wordt vervolgens de eerste vorm van een relatie met leeftijdsgenoten onderzocht; het gepest worden door leeftijdsgenoten. Er wordt aangenomen dat D/SH kinderen extra kwetsbaar zijn om gepest te worden. Dit komt door mogelijke communicatieproblemen met (horende) leeftijdsgenoten

⁹ Theory of Mind verwijst naar de vaardigheid om jezelf te kunnen verplaatsen in de gevoelens, gedachten, wensen en bedoelingen van andere individuen.

en omdat zij 'anders' zijn dan de meerderheid (McCrone, 2004). In de studie omschreven in hoofdstuk 5 werd deze aanname deels bevestigd. De resultaten lieten namelijk zien dat D/SH kinderen over het algemeen niet meer gepest werden dan horende kinderen. Echter, wanneer naar de verschillende vormen van pestgedrag werd gekeken, bleken D/SH kinderen wel meer genegeerd te worden, minder uitgenodigd op feestjes, en werden er meer gemene dingen tegen ze gezegd. Daarnaast werden D/SH in het speciale onderwijs meer gepest dan D/SH kinderen in het reguliere onderwijs.

De onderliggende emotionele factor 'verdriet' droeg in zowel D/SH als horende kinderen bij aan de kans om gepest te worden. Het teruggetrokken gedrag dat gepaard gaat met verdriet zit succesvolle relaties met leeftijdsgenoten in de weg. Er was dus geen verschil tussen de D/SH en normaal horende groepen wat betreft de invloed van emotionele factoren op de kans op gepest te worden.

Wel werden er verschillen tussen D/SH en normaal horende kinderen gevonden op de invloed van de onderzochte sociale factoren. Op basis van eerder onderzoek met normaal horende kinderen waren deze sociale factoren verschillende oudergedragingen, zoals de eisen die ouders stellen aan hun kind, of het sensitief zijn naar hun kind (Bowers, Smith, & Binney, 1994; Ladd & Kochenderfer-Ladd, 1998). Resultaten toonden aan dat het stellen van hogere eisen de kans verkleinde dat D/SH kinderen gepest werden. Dit verband werd niet gevonden in horende kinderen. Een tweede verschil was dat D/SH kinderen, waarvan de ouders rapporteerden sensitiever te zijn, minder gepest werden. In horende kinderen hield meer sensitiviteit gerapporteerd door de ouders juist verband met een grotere kans om gepest te worden. De interpretatie van deze bevindingen wordt bediscussieerd in het hoofdstuk, maar samenvattend duiden de resultaten erop dat ouders een directe invloed kunnen hebben op de relaties met leeftijdsgenootjes van hun D/SH kinderen.

In **Hoofdstuk 6** wordt de ontwikkeling van een vragenlijst naar vriendschappen geëvalueerd. Vriendschappen worden vaak geassocieerd met geheimen delen, leuke dingen doen met elkaar en andere positieve aspecten. Máár, een vriendschap is helaas niet alleen maar rooskleurig. Zo kan er ook veel ruzie of competitie in een vriendschap voorkomen. Eerder onderzoek heeft aangetoond dat de positieve en negatieve aspecten van een vriendschap twee onafhankelijke dimensies zijn (cf. Berndt, 2004). Toch lag de focus van de vragenlijsten die tot nu toe zijn ontwikkeld vooral op de positieve aspecten van een vriendschap. Om

die reden is de Best Friend Index ontwikkeld, waarin een gelijk aantal positieve en negatieve aspecten van een vriendschap worden bevraagd. Tevens bestaan de vragen uit relatief eenvoudige semantische en syntactische structuren, zodat de lijst gebruikt kan worden in klinische groepen met taalproblemen, zoals D/SH kinderen. De resultaten van hoofdstuk 6 lieten zien dat de Best Friend Index betrouwbaar is.

Hoofdstuk 7 beschrijft vervolgens het onderzoek naar de vriendschappen van D/SH kinderen. De resultaten van dit onderzoek toonden aan dat de kwaliteit van vriendschappen van D/SH kinderen lager was (i.e., minder positieve aspecten en meer negatieve aspecten) dan van normaal horende kinderen. Het maakte niet uit of D/SH kinderen een D/SH of een normaal horend vriend(innet)je hadden; het hoofdeffect voor verschillen in vriendschapskwaliteit was het schooltype. Dat wil zeggen dat D/SH kinderen in het speciale onderwijs een lagere vriendschapskwaliteit hadden dan D/SH kinderen in het reguliere onderwijs. Daarnaast werd in deze studie de ontwikkeling van vriendschappen over de tijd heen onderzocht. Dit betekent dat er werd gekeken naar de stabiliteit van vriendschappen en hoe veranderingen in vriendschapskwaliteit verklaard konden worden door veranderingen in onderliggende factoren. De onderliggende sociale factoren waren het begrijpen van de emoties van anderen en hierop reageren met gepast prosociaal gedrag (i.e., empathie), en het tonen van antisociaal, agressief gedrag (Cillessen, Jiang, West, & Laszkowski, 2005; Smith & Rose, 2011). Resultaten toonden aan dat de stabiliteit van vriendschappen en de verbanden tussen vriendschapskwaliteit en empathie en agressie hetzelfde waren in D/SH als in horende kinderen. Dit wil zeggen dat het ontwikkelingspatroon van vriendschappen in D/SH kinderen hetzelfde is als in normaal horende kinderen.

In **hoofdstuk 8** worden alle resultaten op een rijtje gezet en bediscussieerd. De meeste problemen die D/SH kinderen ondervonden bleken samen te hangen met sociale aspecten. Uit de gemiddelde scores kwam naar voren dat zij problemen ervoeren in het sociaal functioneren, zij rapporteerden bijvoorbeeld een lagere vriendschapskwaliteit, minder empathisch vermogen, en ondervonden sommige vormen van pestgedrag meer dan normaal horende kinderen. Tevens kwam naar voren in de onderzochte verbanden tussen internaliserende problematiek, relaties met leeftijdsgenoten en de verklarende factoren, dat D/SH kinderen het meest verschilden van horende kinderen in de invloed van sociale

factoren. Minder sociaal begrip leidde bij D/SH kinderen bijvoorbeeld tot depressieve symptomen. Dit verband werd niet gevonden in normaal horende kinderen. Daarnaast speelden de ouders een belangrijke rol in de relaties met leeftijdsgenoten van D/SH kinderen, terwijl dit verband afwezig of meer complex was tussen ouders en normaal horende kinderen. Ten slotte worden in dit hoofdstuk de implicaties besproken voor zowel de praktijk als verder onderzoek van de bevindingen uit de studies beschreven in dit proefschrift.



References

- Achenbach, T.M., McConaughy, S., & Howell, C.T. (1987). Child / adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, 87, 213-232.
- Aiken, L.S., & West, S.G. (1991). *Multiple regression: testing and interpreting interactions*. Newbury Park, California: Sage.
- Aloise-Young, P.A., Graham, J.W., & Hansen, W.B. (1994). Peer influence on smoking initiation during early adolescence: A comparison of group members and group outsiders. *Journal of Applied Psychology*, 79, 281-287.
- Altieri, N.A., Pisoni, D.B., & Townsend, J.T. (2011). Some normative data on lip-reading skills (L). *The Journal of the Acoustical Society of America*, 130, 1-4.
- Antia, S.D., Jones, P., Luckner, J., Kreimeyer, K., & Reed, S. (2011). Social outcomes of students who are deaf and hard of hearing in general education classrooms. *Exceptional Children*, 77, 489-504.
- Antonovsky, A. (1993). The structure and properties of the sense of coherence scale. *Social Science and Medicine*, 36, 725-733.
- Baerveldt, C., Van Rossem, R., & Vermande, M. (2003). Pupils' delinquency and their social networks: A test of some network assumptions of the ability and inability models of delinquency. *Dutch Journal of Social Sciences*, 39, 107-125.
- Bagwell, C.L., Bender, S.E., Andreassi, C.L., Kinoshita, T.L., Montarello, S.A., & Muller, J.G. (2005). Friendship quality and perceived relationship changes predict psychosocial adjustment in early adulthood. *Journal of Social and Personal Relationships*, 22, 235-254.
- Bagwell, C.L., Newcomb, A.F., & Bukowski, W.M. (1998). Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Development*, 69, 140-153.
- Bandura, A. (1977). *A social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Banister, P., Burman, E., Parker, I., Taylor, M., & Tindall, C. (2011). *Qualitative methods in psychology: A research guide*. Buckingham, UK: Open University Press.
- Banks, J., Gray, C., & Fyfe, R. (1990). The written recall of printed stories by severely deaf children. *British Journal of Educational Psychology*, 60, 192-206.
- Banny, A.M., Heilbron, N., Ames, A., & Prinstein, M.J. (2011). Relational benefits of relational aggression: Adaptive and maladaptive associations with adolescent friendship quality. *Developmental Psychology*, 47, 1153-1166.
- Barker, D.H., Quittner, A.L., Fink, N.E., Eisenberg, L.S., Tobey, E.A., & Niparko, J.K. (2009). Predicting behavior problems in deaf and hearing children: the influences of language, attention, and parent-child communication. *Developmental Psychopathology*, 21, 373-392.
- Baron Cohen, S., Leslie, A.M., & Frith, U. (1985). Does the autistic child have a "theory of mind"? *Cognition*, 21, 37-46.

- Bat-Chava, Y (1993). Antecedents of self-esteem in deaf people: A meta-analytic review. *Rehabilitation Psychology*, 38, 221-234.
- Bat-Chava, Y., Martin, D., & Kosciw, J.G. (2005). Longitudinal improvements in communication and socialization of deaf children with cochlear implants and hearing aids: Evidence from parental reports. *Journal of Child Psychology and Psychiatry*, 46, 1287-1296.
- Bauman, S., & Pero, H. (2011). Bullying and Cyberbullying Among Deaf Students and Their Hearing Peers: An Exploratory Study. *Journal of Deaf Studies and Deaf Education*, 16, 236-253.
- Bavelier, D., Newport, E., & Supalla, T. (2003). Signed or Spoken: Children need natural languages. *Cerebrum*, 5, 19-32.
- Beadle, E.A.R., McKinley, D.J., Nikolopoulos, T.P., Brough, J., O'Donoghue, G.M., & Archbold, S.M. (2005). *Otology & Neurotology*, 26, 1152-1160.
- Berndt, T.J. (2002). Friendship quality and social development. *Current Directions in Psychological Science*, 11, 7-10.
- Berndt, T.J. (2004). Children's friendships: Shifts over half-century in perspectives on their development and their effects. *Merrill-Palmer Quarterly*, 50, 206-223.
- Bess, F.H., Dodd-Murphy, J., & Parker, R.A. (1998). Children with minimal sensorineural hearing loss: Prevalence, educational performance, and functional status. *Ear and Hearing*, 19, 339-354.
- Bettge, S., Wille, N., Barkmann, C., Schulte-Markwort, M., & Ravens-Sieberer, U. (2008). Depressive symptoms of children and adolescents in a German representative sample: results of the BELLA study. *European Child and Adolescent Psychiatry*, 17, 71-81.
- Betts, J., Gullone, E., & Allen, J.S. (2009). An examination of emotion regulation, temperament and parenting as potential predictors of adolescent depression risk status. *British Journal of Developmental Psychology*, 27, 473-485.
- Birmaher, B., Ryan, N.D., Williamson, D.E., Brent, D.A., Kaufman, J., Dahl, R.E., Perel, J., & Nelson, R.N. (1996). Childhood and adolescent depression: a review of the past 10 years. Part I. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 1427-1439.
- Bishop, D.V.M. (1998) Development of the Children's Communication Checklist (CCC): a method for assessing qualitative aspects of communicative impairment in children. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 39, 879-891.
- Boivin, M., Hymel, S., & Bukowski, W.M. (1995). The roles of social withdrawal, peer rejection, and victimization by peers in predicting loneliness and depressed mood in childhood. *Development and Psychopathology*, 7, 765-785.
- Bollen, K. (1989). *Structural equations with latent variables*. New York: Wiley.

- Bond, L., Carlin, J.B., Thomas, L., Rubin, K., & Patton, G. (2001). Does bullying cause emotional problems? A prospective study of young teenagers. *British Medical Journal*, 323, 480-484.
- Boney McCoy, S., & Finkelhor, D. (1996). Is youth victimization related to trauma symptoms and depression after controlling for prior symptoms and family relationships? A longitudinal, prospective study. *Journal of Consulting and Clinical Psychology*, 64, 1406-1416.
- Boons, T., Brokx, J.P.L., Dhooge, I., Frijns, J.H.M., Peeraer, L., Vermeulen, A., Wouters, J., & van Wieringen, A. (2012). Predictors of spoken language development following pediatric cochlear implantation. *Ear and Hearing*, 33, 617-639.
- Boulton, M.J., Trueman, M., & Murray L. (2010). Associations between peer victimization, fear of future victimization and disrupted concentration on class work among junior school pupils. *British Journal of Educational Psychology*, 78, 473-489.
- Bowers, L., Smith, P.K., & Binney, V. (1994). Perceived family relationships of bullies, victims and bully/victims in middle childhood. *Journal of Social and Personal Relationships*, 11, 215-232.
- Bowker, A. (2004). Predicting friendship stability during early adolescence. *Journal of Early Adolescence*, 24, 85-112.
- Brener, N.D., Billy, J.O.G., & Grady, W.R. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: Evidence from the scientific literature. *Journal of Adolescent Health*, 33, 436-457.
- Bronfenbrenner, V. (1979). *The ecology of human development: experiments by nature and design*. Cambridge: Harvard University Press.
- Brubaker, R.G. & Szakowski, A. (2000). Parenting Practices and Behavior Problems Among Deaf Children. *Child and Family Behavior Therapy*, 22, 13-28.
- Brunnberg, E. (2005). The school playground as a meeting place for hard of hearing children. *Scandinavian Journal of Disability Research*, 7, 73-90.
- Bukowski, W.M., Hoza, B., & Boivin, M. (1994). Measuring friendship quality during pre- and early adolescence: The development and psychometric properties of the Friendship Qualities Scale. *Journal of Social and Personal Relationships*, 11, 471-484.
- Bukowski, W.M., Newcomb, A.F., & Hartup, W.W. (1996). *The Company They Keep: Friendship in Childhood and Adolescence*. New York: Cambridge University Press.
- Calderon, R., & Greenberg, M. (2003). Social and Emotional Development of Deaf children Family, School, and Program Effects. In M. Marschark & P.E. Spencer (Eds.), *Oxford Handbook of Deaf Studies, Language, and Education* (p. 177-189). Oxford University Press.
- Camodeca, M., & Goossens, F.A. (2005). Aggression, social cognitions, anger and sadness in bullies and victims. *Journal of Child Psychology and Psychiatry*, 46, 186-197.

- Campo, J.V., Bridge, J., Ehmann, M., Altman, S., Lucas, A., Birmaher, B., & Brent, D. A. (2004). Recurrent abdominal pain, anxiety, and depression in primary care. *Pediatrics*, 113, 817-824.
- Campo, J.V., Jansen-McWilliams, L., Comer, D.M., & Kelleher, K.J. (1999). Somatization in pediatric care: Association with psychopathology, functional impairment and the use of services. *Journal of American Academy of Child and Adolescent Psychiatry*, 38, 1093-1101.
- Card, N.A., & Hodges, E.V.E. (2007). Peer victimization among schoolchildren: correlations, causes, consequences, and considerations in assessment and intervention. *School Psychology Quarterly*, 23, 451-461.
- Cawthon, S. (2006). National Survey of accommodations and Alternate Assessments for Students who are Deaf or Hard of Hearing in the United States. *Journal of Deaf Studies and Deaf Education*, 11, 337-359.
- Cawthon, S. (2011). Test Item Linguistic Complexity and Assessments for Deaf Students. *American Annals of the Deaf*, 156, 255-269.
- Cawthon, S., & the Online Research Lab. (2008). Accommodations use for statewide standardized assessments: Prevalence and recommendations for students who are Deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education*, 13, 55-96.
- Cawthon, S., Winton, S., Garberoglio, C., & Gobble, M. (2011). The effects of ASL as an accommodation for students who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education*, 16, 198-211.
- Chan, A., & Poulin, F. (2007). Monthly changes in the composition of friendship networks in early adolescence. *Merill-Palmer Quarterly*, 53, 578-602.
- Christiansen, J.B., & Leigh, I.W. (2004). Children with cochlear implants; changing parent and deaf community perspectives. *Archives of Otolaryngology Head and Neck Surgery*, 130, 673-677.
- Cicchetti, D., & Toth, S.L. (2009). The past achievements and future promises of developmental psychopathology: The coming of age of a discipline. *Journal of Child Psychology and Psychiatry*, 50, 16-25.
- Cillessen, A.H., Jiang, X.L., West, T.V., & Laszkowski, D.K. (2005). Predictors of dyadic friendship quality in adolescence. *International Journal of Behavioral Development*, 29, 165-172.
- Cleary, M., Pisoni, D.B., & Geers, A.E. (2001). Some measures of verbal and spatial working memory in eight- and nine-year-old hearing-impaired children with cochlear implants. *Ear and Hearing*, 22, 395-411.
- Coll, K., Cutler, M., Thobro, P., Haas, R., & Powell, S. (2009). An exploratory study of psychosocial risk behaviors of adolescents who are deaf or hard of hearing: comparisons and recommendations. *American Annals of the Deaf*, 154, 30-35.

- Connolly, C.M. (2006). Identifying and assessing depression in prelingually deaf people: A literature review. *American Annals of the Deaf*, 151, 49-60.
- Corina, D., & Singleton, J. (2009). Developmental social cognitive neuroscience: Insights from deafness. *Child Development*, 80, 952-967.
- Cornes, A., Rohan, M.J., Napier, J., & Rey, J.M. (2006). Reading the signs: impact of signed versus written questionnaires on the prevalence of psychopathology among deaf adolescents. *Australian and New Zealand Journal of Psychiatry*, 40, 665-73.
- Courtin, C. (2000). The impact of sign language on the cognitive development of deaf children. *Journal of Deaf Studies and Deaf Education*, 5, 266-276.
- Crawford, L., & Tindal, C. (2004). Effects of a read-aloud modification on a standardized reading test. *Exceptionality*, 12, 89-106.
- Crick, N.R. (1995). Relational aggression: The role of intent attributions, feelings of distress, and provocation type. *Developmental Psychopathology*, 7, 313-322.
- Crick, N.R., & Grotpeter, J.K. (1995). Relational aggression, gender, and social psychological adjustment. *Child Development*, 66, 710-722.
- Croffie, J.M., Fitzgerald, J.F., & Chong, S.K. (2000). Recurrent abdominal pain in children - a retrospective study of outcome in a group referred to a pediatric gastroenterology practice. *Clinical Pediatrics*, 39, 267-74.
- Cummings, E.M., Davies, P.T., & Campbell, S.B. (2000). *Developmental psychopathology and family process: Theory, research, and clinical implications*. New York: Guilford Publications, Inc.
- Dammeyer, J. (2010). Psychosocial development in a Danish population of children with cochlear implants and deaf and hard-of-hearing children. *Journal of Deaf Studies and Deaf Education*, 15, 50-58.
- Davis, M.H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, 10, 85.
- Denham, S.A., Blair, K.A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence. *Child Development*, 74, 238-256.
- Denham, S.A., Mitchell-Copeland, J., Strandberg, K., Auerbach, S., & Blair, K. (1997). Parental contributions to preschoolers' emotional competence: Direct and indirect effects. *Motivation and Emotion*, 21, 65-86.
- Denham, S.A., Renwick-DeBardi, S., & Hewes, S. (1994). Emotional communication between mothers and preschoolers: Relations with emotional competence. *Merrill-Palmer Quarterly*, 40, 488-508.

DiBartolo, P.M., & Grills, A.E. (2006). Who is best at predicting children's anxiety in response to a social evaluative task? A comparison of child, parent, and teacher reports. *Journal of Anxiety Disorders*, 20, 630-645.

Dodge, K.A., & Coie, J.D. 1987. Social information processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology*, 53, 1146-58.

Durkin, K., & Conti-Ramsden, G. (2007). Language, social behavior, and the quality of friendships in adolescents with and without a history of specific language impairment. *Child Development*, 78, 1441-1457.

Eisenberg, N., Spinrad, T.L., & Cumberland, A. (1998). Parental Socialization of Emotion: Reply to Commentaries. *Psychological Inquiry*, 4, 317-333.

Eisenberg, N., & Strayer, J. (1987). Critical issues in the study of empathy. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 3-13). NewYork: Cambridge University Press.

Enns, C.J., & Herman, R.C. (2011). Adapting the Assessing British Sign Language Development: Receptive Skills Test into American Sign Language. *Journal of Deaf Studies and Deaf Education*, 16, 362-374.

Eriks-Brophy, A., Durieux-Smith, A., Olds, J., Fitzpatrick, E., Duquette, C., & Whittingham, J. (2006). Facilitators and barriers to the inclusion of orally educated children and youth with hearing loss in schools: promoting partnerships to support inclusion. *The Volta Review*, 106, 53-88.

Eriksson, M., & Lindström, B. (2005). Validity of Antonovsky's sense of coherence scale: A systematic review. *Journal of Epidemiology and Community Health*, 59, 460-466.

Espelage, D.L., Mebane, S.E., & Adams, R.S. (2004). Empathy, caring, and bullying: Toward an understanding of complex associations. In D.L. Espelage & S. M. Swearer (Eds.), *Bullying in American schools: A social-ecological perspective on prevention and intervention* (pp. 37-61). Mahwah, NJ: Erlbaum.

Fagan, M., Pisoni, D., Horn, D., & Dillon, C. (2007). Neuropsychological correlates of vocabulary, reading, and working memory in deaf children with cochlear implants. *Journal of Deaf Studies and Deaf Education*, 12, 461-471.

Fellinger, J., Holzinger, D., Beitel, C., Laucht, M., & Goldberg, D.P. (2009). The impact of language skills on mental health in teenagers with hearing impairments. *Acta Psychiatrica Scandinavica*, 120, 153-159.

Fellinger, J., Holzinger, D., & Pollard, R. (2012). Mental Health of Deaf People. *The Lancet*, 379, 1037-1044.

- Fellinger, J., Holzinger, D., Sattel, H., Laucht, M., & Goldberg, D. (2009). Correlates of mental disorders among children with hearing impairments. *Developmental Medicine and Child Neurology*, 51, 635-641.
- Fellinger, J., Holzinger, D., Sattel, H., & Laucht, M. (2008). Mental health and quality of life in deaf pupils. *European Child & Adolescent Psychiatry*, 17, 414-423.
- Flynt, S.W., & Morton, R.C. (2004). Bullying and Children with Disabilities. *Journal of Instructional Psychology*, 31, 330-333.
- Fortnum, H.M., Marshall, D.H., & Summerfield, A.Q. (2002). Epidemiology of the United Kingdom population of hearing impaired children including characteristics of those with and without cochlear implants - audiology, etiology and affluence. *International Journal of Audiology*, 41, 170-179.
- Fortnum, H.M., Summerfield, A.Q., Marshal, D.H., Davis, A.C., & Bamford, J.M. (2001). Prevalence of permanent childhood hearing impairment in the United Kingdom and implications for universal neonatal hearing screening: Questionnaire-based ascertainment study. *British Medical Journal*, 323, 1-6.
- Frick, P.J. (1991). *The Alabama Parenting Questionnaire*. Unpublished rating scale, University of Alabama.
- Frijda, N.H. (1986). *The emotions*. Cambridge, UK: Cambridge University Press.
- Furman, W., & Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology*, 21, 1016-1024.
- Ganek, H., McConkey Robbins, A., & Niparko, J.K. (2012). Language outcomes after cochlear implantation. *Otolaryngologic Clinics of North America*, 45, 173-185.
- Gerris, J.R.M., Boxtel, D.A.A.M., Vermulst, A.A., Janssens, J.M.A.M., Zutphen, R.A.H. van, & Felling, A.J.A. (1993). *Parenting in Dutch families*. Nijmegen, the Netherlands: University of Nijmegen, Institute of Family Studies.
- Gilman, R., Eastbrooks, S.R. & Frey, M. (2004). A preliminary study of multidimensional life satisfaction among deaf/hard of hearing youth across environmental settings. *Social indicators research*, 66, 143-164.
- Girolametto, L., & Weitzman, E. (2007). Promoting peer interaction skills: Professional development for early childhood educators and preschool teachers. *Topics in Language Disorders*, 27, 93-110.
- Glickman, N. (2007) Do you hear voices? Problems in assessment of mental status in deaf persons with severe language deprivation. *Journal of Deaf Studies and Deaf Education*, 12, 127-147.
- Goldin-Meadow, S., & Mayberry, R. I. (2001). How do profoundly deaf children learn to read? *Learning Disabilities Research and Practice*, 16, 222-229.

- Graber, J.A., & Sontag, L.M. (2009). Internalizing problems during adolescence. In: R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology, Volume 1, Individual bases of adolescent development* (3rd ed.). New York: John Wiley & Sons, Inc.
- Greenberg, M.T., & Kusché, C.A. (1993). *Promoting social and emotional development in deaf children: The PATHS project*. Seattle: University of Washington Press.
- Güroğlu, B., Cillessen, A.H.N., Haselager, G.J.T., & Lieshout, C.F.M., van (2012). "Tell me who your friends are and I'll tell you who your friends will be": Consistency and change in social competence in adolescent friendships across school transitions. *Journal of Social and Personal Relationships*. doi: 10.1177/0265407512448272
- Halberstadt, A.G., Denham, S.A., & Dunsmore, J.C. (2001). Affective social competence. *Social Development*, 10, 79-119.
- Hambleton, R.K., Merenda, P., & Spielberger, C. (Eds.). (2005). *Adapting educational and psychological tests for cross-cultural assessment*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Harden, J.J. (2011). A bootstrap method for conducting statistical inference with clustered data. *State Politics & Policy Quarterly*, 11, 223-246.
- Harris, P.L. (1989). *Children and emotions: The development of psychological understanding*. Cambridge: Basic Blackwell.
- Hartup, W.W., & Stevens, N. (1997). Friendships and adaptation in the life course. *Psychological Bulletin*, 121, 355-370.
- Hays, R. D., Vickrey, B. G., Hermann, B. P., Perrine, K., Cramer, J., Meador, K., Spritzer, K., & Devinsky, O. (1995). Agreement between self-reports and proxy reports of quality of life of epilepsy patients. *Quality of Life Research*, 4, 159-168.
- Hedeker, D., & Gibbons, R.D. (2006). *Longitudinal Data Analysis*. New York: Wiley.
- Herman, R., Holmes, S., & Woll, B. (1999). *Assessing British Sign Language development: Receptive skills test*. London, England: City University.
- Hermans, D., Knoors, H.E.T., & Verhoeven, L. (2010). Assessment of sign language development: the case of deaf children in the Netherlands. *Journal of Deaf Studies and Deaf Education*, 15, 107-119.
- Hindley, P.A., Hill, P.D., McGuigan, S., & Kitson, N. (1994). Psychiatric disorder in deaf and hearing impaired children and young people: A prevalence study. *Journal of Child Psychology and Psychiatry*, 35, 917-934.
- Hintermair, M. (2006). Parental resources, parental stress, and socioemotional development of deaf and hard of hearing children. *Journal of Deaf Studies and Deaf Education*, 11, 493-513.

- Hintermair, M. (2011). Health-Related quality of life and classroom participation of deaf and hard-of-hearing students in general schools. *Journal of Deaf Studies and Deaf Education*, 16, 254-271.
- Holmbeck, G.N., Johnson, S.Z., Wills, K.E., McKernon, W., Rose, B., Erklin, S., & Kemper. (2002). Observed and perceived parental overprotection in relation to psychosocial adjustment in preadolescents with a physical disability: The mediational role of behavioral autonomy. *Journal of Consulting and Clinical Psychology*, 70, 96-110.
- Hoover, J.H., & Oliver, R. (1996). *The bullying prevention handbook: A guide for principals, teachers, and counselors*. Bloomington, IN: National Educational Service.
- Hosie, J.A., Russell, P.A., Gray, C.D., Scott, C., Hunter, N., Banks, J.S., & Macauley, M.C. (2000). Knowledge of display rules in prelingually deaf and hearing children. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41, 389-398.
- Huber, M. (2005). Health-related quality of life of Austrian children and adolescents with cochlear implants. *International Journal of Pediatric Otorhinolaryngology*, 69, 1089-1101.
- Jellesma, F.C., Rieffe, C., & Meerum Terwogt, M. (2007). The somatic complaint list: Validation of a self-report questionnaire assessing somatic complaints in children. *Journal of Psychosomatic Research*, 63, 399-401.
- Jellesma, F.C., Rieffe, C., Meerum Terwogt, M., & Kneepkens, F.C.M. (2006). Somatic complaints and health care use in children: Mood, emotion awareness and sense of coherence. *Social Science and Medicine*, 63, 2640-2648.
- Jellesma, F.C., Rieffe, C., Meerum Terwogt, M., & Westenberg, M. (2011). Children's sense of coherence and trait emotional intelligence: A longitudinal study exploring the development of somatic complaints. *Psychology and Health*, 26, 307-320.
- Jöreskog, K.G., & Van Thillo, M. (1972). *LISREL: A general computer program for estimating a linear structural equation system involving multiple indicators of unmeasured variables*. Princeton, NJ: Educational Testing Service.
- Juvonen, S., Nishina, A., & Graham, S. (2001). Self-views versus peer perceptions of victimization among early adolescents. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 105-124). New York: Guilford Press.
- Kashdan, T.B., Barrios, V., Forsyth, J.P., & Steger, M.F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy*, 44, 1301-1320.
- Keilman, A., Limberger, A., & Mann, W.J. (2007). Psychological and physical well-being in hearing impaired children. *International Journal of Pediatric Otorhinolaryngology*, 71, 1747-1752.

- Keller, M.B., Lavori, P.W., Beardslee, W.R., Wunder, J., & Ryan, N. (1991). Depression in children and adolescents: new data on 'undertreatment' and a literature review on the efficacy of available treatments. *Journal of Affective Disorders*, 21, 163-171.
- Kent, B.A. (2003). Identity issues for hard-of-hearing adolescents aged 11, 13, and 15 in mainstream setting. *Journal of Deaf Studies and Deaf Education*, 8, 315-324.
- Khan, S., Edwards, L., & Langdon, D. (2005). The cognition and behaviour of children with cochlear implants, children with hearing aids and their hearing peers: A comparison. *Audiology and Neurotology*, 10, 117-126.
- Kim, J., & Cicchetti, D. (2009). Mean-level change and intraindividual variability in self-esteem and depression among high-risk children. *International Journal of Behavioral Development*, 33, 202-214.
- Kistner, J., Balthazor, M., Riski, S., & Burton, C. (1999). Predicting dysphoria in adolescence from actual and perceived peer acceptance in childhood. *Journal of Clinical Child Psychology*, 28, 94-104.
- Kluwin, T.N., Stinson, M.S., & Colarossi, G.M. (2002). Social processes and outcomes of in-school contact between deaf and hearing peers. *Journal of Deaf Studies and Deaf Education*, 7, 200-213.
- Knoors, H.E.T. (2007). Educational responses to varying objectives of parents of deaf children: A Dutch perspective. *Journal of Deaf Studies and Deaf Education*, 12, 243-253.
- Kochenderfer-Ladd, B. (2004). Peer victimization: The role of emotion in adaptive and maladaptive coping. *Social Development*, 13, 329-349.
- Konuk, N., Erdogan, A., Atik, L., Ugur, M.B., & Simsekyilmaz, O. (2006). Evaluation of behavioral and emotional problems in deaf children by using the child behavior checklist. *Neurology Psychiatry and Brain Research*, 13, 59-64.
- Kort, W., Schittekatte, M., & Compaaan, E. (2008). *CELF-4-NL: Clinical Evaluation of Language Fundamentals-vierde-editie*. Pearson Assessment and Information B.V., Amsterdam.
- Kort, W., Schittekatte, M., Compaaan, E.L., Bosmans, M., Bleichrodt, N., Vermeir, G., & Verhaeghe, P. (2002). *WISC-III NL. Handleiding. Nederlandse bewerking*. London: The Psychological Corporation.
- Korver, A.M.H., Konings, S., Dekker, F.W., Beers, M., Wever, C.C., & Frijns, J.H.M. (2010). Newborn hearing screening vs later hearing screening and developmental outcomes in children with permanent childhood hearing impairment. *Journal of the American Medical Association*, 304, 1701-1708.
- Kouwenberg, M., Rieffe, C. Theunissen, S.C.P.M., & Rooij, M. de (2012). Peer victimization experienced by Children and Adolescents who are Deaf or Hard of Hearing. *PLOS ONE*, 7(12), e52174. doi:10.1371/journal.pone.0052174

- Kouwenberg, M., Rieffe, C., & Banerjee, R.A. (2012). A short and balanced Best Friend Index for children and adolescents. *European Journal of Developmental Psychology*. doi: 10.1080/17405629.2012.707780
- Kouwenberg, M., Rieffe, C. Theunissen, S.C.P.M., & Oosterveld, P. (2012). Pathways underlying somatic complaints in children and adolescents who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education*, 17, 319-332.
- Kouwenberg, M., Rieffe, C., & Theunissen, S.C.P.M. (2011). Intrapersonal and Interpersonal factors related to self-reported symptoms of depression in DHH youth. *International Journal of Mental Health and Deafness*, 1, 46-57
- Kovacs, M. (1985). The Children's Depression Inventory (CDI). *Psychopharmacology Bulletin*, 21, 995-998.
- Kovacs, M. (1992). *Children's Depression Inventory (CDI) [Manual]*. North Tonawanda, NY: Multi-Health Systems.
- Kubzansky, L.D., Martin, L.T., & Buka, S.L. (2009). Early manifestations of personality and adult health: A life course perspective. *Health Psychology*, 28, 364-372.
- Kushalnagar, P., Topolski, T.D., Schick, B., Edwards, T.C., Skalicky, A.M., & Patrick, D.L. (2011). Mode of communication, perceived level of understanding, and perceived quality of life in youth who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education*, 16, 512-523.
- Ladd, G.W., & Kochenderfer-Ladd, B. (1998). Parenting behaviors and Parent-Child Relationships: Correlates of peer victimization in kindergarten? *Developmental Psychology*, 34, 1450-1458.
- Ladouceur, C., Dahl, R., Williamson, D., Birmaher, B., Ryan, N., & Casey, B. (2005). Altered emotional processing in pediatric anxiety, depression, and comorbid anxiety-depression. *Journal of Abnormal Child Psychology*, 33, 165-177.
- La Greca, A.M., & Harrison, H.M. (2005). Adolescent peer relations, friendships, and romantic relationships: Do they predict social anxiety and depression? *Journal of Clinical Child and Adolescent Psychology*, 34, 49-61.
- La Greca, A.M., & Lopez, N. (1998). Social anxiety among adolescents: Linkages with peer relationships and friendships. *Journal of Abnormal Child Psychology*, 26, 83-94.
- Lamoré, P.J.J., Kapteyn, T.S., & Franck, B.A.M. (2000). *Nederlands Leerboek Audiologie*. <http://www.audiologieboek.nl/hfm/hfd10/10-3-1.htm>
- Laursen, B., & Hafen, C.A. (2010). Future directions in the study of close relationships: Conflict is bad (except when it's not). *Social Development*, 19, 858-872.

- Lederberg, A.R., & Everhart, V.S. (2000). Conversations between deaf children and their hearing mothers: Pragmatic and dialogic characteristics. *Journal of Deaf Studies and Deaf Education*, 5, 303-322.
- Lederberg, A.R., & Mobley, C.E. (1990). The effect of hearing impairment on the quality of attachment and mother-toddler interaction. *Child Development*, 61, 1596-1604.
- Lederberg, A.R., Rosenblatt, V., Vandell, D.L., & Chapin, S.L. (1987). Temporary and long-term friendships in hearing and deaf preschoolers. *Merrill-Palmer Quarterly*, 33, 515-534.
- Leigh, W.I., Maxwell-McCaw, D., Bat-Chava, Y., & Christiansen, J.B. (2008). Correlates of psychosocial adjustment in deaf adolescents with and without cochlear implants: A preliminary investigation. *Journal of Deaf Studies and Deaf Education*, 14, 244-259.
- Lewinsohn, P.M., Clarke, G.N., Seeley, J.R., & Rohde, P. (1994). Major depression in community adolescents: age at onset, episode duration, and time to recurrence. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33, 809-818.
- Li, H., & Prevatt, F. (2010). Deaf and hard of hearing children and adolescents in China: Their fears and anxieties. *American Annals of the Deaf*, 155, 458-466.
- Livingston, S., Singer, B., & Abrahamson, T. (1994). Effectiveness compared: ASL interpreting vs. transliteration. *Sign Language Studies*, 23, 1-54.
- Lollis, J., & LaSasso, C. (2009). The appropriateness of the NC state-mandated reading competency test for deaf students as a criterion for high school graduation. *Journal of Deaf Studies and Deaf Education*, 14, 76-98.
- Ma, T.L., & Bellmore, A. (2012). Peer victimization and parental psychological control in adolescence. *Journal of Abnormal Child Psychology*, 3, 413-424.
- Maller, S.J. (2003). Intellectual assessment of deaf people. A critical review of core concepts and issues. In M. Marshark & P. E. Spencer (Eds.), *Handbook of deaf studies and deaf education* (pp. 451-463). Oxford, New York: Oxford University Press.
- Mavroveli, S., Petrides, K.V., Rieffe, C., & Bakker, F. (2010). Trait emotional intelligence, psychological well-being, and peer-related social competence in adolescence. *The British Journal of Developmental Psychology*, 25, 263-275.
- Mayne, T. J. (1999). Negative affect and health: The importance of being earnest. *Cognition and Emotion*, 13, 601-635.
- McConkey-Robbins, A., Burton-Koch, D., Osberger, M.J., Zimmerman-Philips, S., & Kishon-Rabin, L. (2004). Effect of age at cochlear implantation on auditory skill development in infants and toddlers. *Archives of otolaryngology-head & neck surgery*, 130, 570-574.
- McCrone, W.P. (2004). School bullying: A problem for deaf and hard of hearing students? *Odyssey*, 5, 4-9.

- Meadow-Orlans, K.P., & Steinberg, A.G. (1993). Effects of infant hearing loss and maternal support on mother-infant interaction at 18 months. *Journal of Applied Developmental Psychology*, 14, 407-426.
- Meerum Terwogt, M., & Rieffe, C. (2004). Behavioural problems in deaf children: Theory of mind delay or communication failure? *European Journal of Developmental Psychology*, 1, 231-240.
- Meerum Terwogt, M., & Rieffe, C. (2004). Deaf children's use of beliefs and desires in negotiation. *Journal of Deaf Studies and Deaf Education*, 9, 27-38.
- Meerum Terwogt, M., Rieffe, C., Miers, A., Jellesma, F.C., & Tolland, A. (2006). Emotions and self-esteem as indicators of somatic complaints in children. *Infant and Child Development*, 15, 581-592.
- Meesters, C., Muris, P., Ghys, A., Reumerman, T., & Rooijmans, M. (2003). The children's somatization inventory: Further evidence for its reliability and validity in a pediatric and a community sample of Dutch children and adolescents. *Journal of Pediatric Psychology*, 28, 413-422.
- Meristo, M., & Hjelmquist, E. (2009). Executive functions and theory-of-mind among deaf children: Different routes to understanding other minds? *Journal of Cognition and Development*, 10, 67-91.
- Meyer, G.J., Finn, S.E., Eyde, L.D., Kay, G.G., Moreland, K.L., Dies, R. R., (...), & Reed, G.M. (2001). Psychological testing and psychological assessment: A review of evidence and issues. *American Psychology*, 56, 128-165.
- Meyer, T.A., Svirsky, M.A., Kirk, K.I., & Miyamoto, R.T. (1998). Improvements in speech perception by children with profound prelingual hearing loss: Effects of device, communication mode, and chronological age. *Journal of Speech, Language and Hearing Research*, 41, 846-858.
- Miller, S., Malone, P.S., & Dodge, K.A. (2010). Developmental Trajectories of Boys' and Girls' Delinquency: Sex Differences and Links to Later Adolescent Outcomes. *Journal of Abnormal Child Psychology*, 38, 1021-1032.
- Mitchell, R.E., & Karchmer, M.A. (2004). Chasing the mythical ten percent: Parental hearing status of deaf and hard of hearing students in the United States. *Sign Language Studies*, 4, 138-163.
- Moeller, M. (2007). Current state of knowledge: psychosocial development in children with hearing impairment. *Ear and Hearing*, 28, 729-739.
- Moog, J., Gustus, C., Geers, A., & Brenner, C. (2010). Psychosocial adjustment in adolescents who use cochlear implants since preschool. *Ear and Hearing*, 32, 758-83s.

- Morris, A.S., Silk, J.S., Steinberg, L., Myers, S.S., & Robinson, L.R. (2007). The role of the family context in the development of children's emotion regulation. *Social Development*, 16, 361-388.
- Morrison, J.R., & Anders, T.F. (2001). *Interviewing children and adolescents: Skills and strategies for effective DSM-IV diagnosis*. New York: Guilford Press.
- Most, T., Ingber, S., & Heled-Ariam, E. (2011). Social competence, sense of loneliness, and speech intelligibility of young children with hearing loss in individual inclusion and group inclusion. *Journal of Deaf Studies and Deaf Education*, 17, 259- 272.
- Musselman, C. (2000). How do children who can't hear learn to read an alphabetic script? A review of the literature on reading and deafness. *Journal of Deaf Studies and Deaf Education*, 5, 9-31.
- Nikolarazi, M., & Hadjikakou, K.(2006). The role of educational experiences in the development of deaf identity. *Journal of deaf Studies and Deaf Education*, 11, 477-492.
- Ninio, A., & Snow, C.E. (1996). *Pragmatic Development*. Boulder, CO: Westview Press.
- Nunes, T., Pretzlik, U., & Olsson, J. (2001). Deaf children's social relationships in mainstream schools. *Deafness and Education International*, 3, 123-136.
- Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Olweus D. (1989). *Bully/Victim problems among school children: Basic facts and effects of a school based intervention Program*. Erlbaum, Hillsdale, NJ.
- Olweus, D. (1989). *The Olweus bully/victim questionnaire*. Bergen: Mimeograph.
- Orr, D.P., & Ingersoll, G.M. (1988). Adolescent development: a biopsychosocial review. *Current Problems in Pediatrics*, 18, 447-99.
- Osterlind, S.J., & Everson, H.T. (2010). *Differential item functioning (2nd ed.)*. Newbury Park, CA: Sage.
- Parker, J.G., & Asher, S.R. (1993). Friendship and friendship quality in middle childhood: links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology*, 29, 611-621.
- Parker, J.G., Rubin, K.H., Erath, S.A., Wojslawowicz, J.C., & Buskirk, A.A. (2006). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (pp. 419-493). Hoboken, NJ: Wiley.
- Paul, P. (2003). Processes and components of reading. In M. Marschark & P. Spencer (Eds.), *Handbook of deaf studies, language and education* (pp. 97-109). New York: Oxford University Press.

- Percy-Smith, L., Caye-Thomasen, P., Gudman, M., Jensen, J.H., & Thomsen, J. (2008). Self-esteem and social well-being of children with cochlear implant compared to normal-hearing children. *International Journal of Pediatric Otorhinolaryngology*, 72, 1113-1120.
- Perry, D.G., Hodges, E.V.E., & Egan, S.K. (2001). Determinants of chronic victimization by peers: A review and new model of family influence. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 73-104). New York: Guilford.
- Peterson, C.C. (2009). Development of social-cognitive and communication skills in children born deaf. *Scandinavian Journal of Psychology*, 50, 475-483.
- Peterson, C.C., & Siegal, M. (1995). Deafness, conversation and theory of mind. *Journal of Child Psychology and Psychiatry*, 36, 459-474.
- Peterson, C., & Wellman, H.M. (2009). From fancy to reason: scaling deaf and hearing children's understanding of theory of mind and pretence. *The British Journal of Developmental Psychology*, 27, 297-310.
- Peterson, C.C., Wellman, H.M., & Slaughter, V. (2012). The mind behind the message: Advancing Theory of Mind scales for typically developing children, and those with deafness, autism, or asperger syndrome. *Child Development*, 2, 469-485.
- Petitto, L.A. (2000). On the biological foundations of human language. In: K. Emmorey & H. Lane (Eds.), *The signs of language revisited: An anthology in honor of Ursula Bellugi and Edward Klima* (pp. 447-471). Mahwah, NJ: Lawrence Erlbaum Associates.
- Petrides, K.V., & Furnham, A. (2004). *Technical manual of the Trait Emotional Intelligence Questionnaire (TEIQue)*. London: University of London, Institute of Education.
- Pike, R.W. (1989). *Creative Training Techniques Handbook*. Minneapolis: Lakewood Books.
- Polat, F. (2003). Factors affecting psychosocial adjustment of deaf students. *Journal of Deaf Studies and Deaf Education*, 8, 325-339.
- Pollard, R.Q. (1998). Psychopathology. In: M. Marschark & M.D. Clak (Eds.), *Psychological perspectives on deafness*. (pp. 171-197). Hillsdale, NJ: Erlbaum.
- Polman, H., Orobio de Castro, B., Koops, W., Van Boxtel, H. W., & Merk, W. (2007). A metaanalysis of the distinction between reactive and proactive aggression in children and adolescents. *Journal of Abnormal Child Psychology*, 35, 522-535.
- Poulin, F., & Chan, A. (2010). Friendship stability and change in childhood and adolescence. *Developmental Review*, 30, 257-272.
- Preisler, G., Tvingstedt, A.L., & Ahlström, M. (2002). A psychosocial follow-up study of deaf preschool children using cochlear implants. *Child: Care, Health and Development*, 28, 403-418.

- Preiss, M., & Remschmidt, H. (2007). Depressive disorders in childhood and adolescence. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*, 35, 385-397.
- Pressman, L.J., 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, 294-304.
- Pritchard, A., & Woollard, J. (2010). *Psychology for the Classroom: Constructivism and Social Learning*. Abingdon, Oxon: Routledge.
- Punch, R., & Hyde, M. (2011). Social participation of children and adolescents with cochlear implants: A qualitative analysis of parent, teacher, and child interviews. *Journal of Deaf Studies & Deaf Education*, 16, 2-20.
- Quittner, A.L., Barker, D.H., Cruz, I., Snell, C. Grimley, M.E., Botteri, M., & The CDaCI Investigative Team. Parenting stress among parents of deaf and hearing children: associations with language delays and behavior problems. *Parenting: Science and Practice*, 12, 136-155
- R Development Core Team. (2007) *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.
- Reed, S., Antia, S.D., & Kreimeyer, K.H. (2008). Academic status of deaf and hard-of-hearing students in public schools: Student, home, and service facilitators and detractors. *Journal of Deaf Studies and Deaf Education*, 13, 485-502.
- Remine, M.D., & Brown, P.M. (2010). Comparison of the prevalence of mental health problems in deaf and hearing children and adolescents in Australia. *Australian and New Zealand Journal of Psychiatry*, 44, 351-357.
- Rieffe, C. (2012). Awareness and regulation of emotions in deaf children. *British Journal of Developmental*, 4, 477-492.
- Rieffe, C., Camodeca, M., Pouw, L.B.C., Lange, A.M.C., & Stockmann, L. (2012). Don't anger me! Bullying, victimization, and emotion dysregulation in Young adolescents with ASD. *European Journal of Developmental Psychology*, 9, 351-370.
- Rieffe, C., & De Rooij, M. (2012). The longitudinal relationship between emotion awareness and internalising symptoms during late childhood. *Journal of European Child & Adolescent Psychiatry*, 6, 349-356.
- Rieffe, C., Faber, J., Güroğlu, B., Tsutsui, M.M., & Kouwenberg, M. (submitted). Disentangling reactive and proactive aggression in children by using self-report.
- Rieffe, C., & Meerum Terwogt, M. (2000). Deaf children's understanding of emotions: desires take precedence. *Journal of Child Psychology, Psychiatry and allied Disciplines*, 41, 601-608.
- Rieffe, C., & Meerum Terwogt, M. (2006). Anger communication in deaf children. *Cognition and Emotion*, 20, 1261-1273.

- Rieffe, C., Meerum Terwogt, M., & Bosch, J.D. (2004). Emotion understanding in children with frequent somatic complaints. *European Journal of Developmental Psychology*, 1, 31-47.
- Rieffe, C., Meerum Terwogt, M., Bosch, J.D., Kneepkens, C.M.F., Douwes, A.C., & Jellesma, F.C. (2007). Interaction between emotions and somatic complaints in children who did or did not seek medical care. *Cognition and Emotion*, 21, 1630-1646.
- Rieffe, C., Meerum Terwogt, M., & Kotronopoulou, K. (2007). Awareness of single and multiple emotions in high-functioning children with autism. *Journal of Autism and Developmental Disorders*, 37, 455-465.
- Rieffe, C., Meerum Terwogt, M., Petrides, K.V., Cowan, R., Miers, A.C., & Tolland, A. (2007). Psychometric properties of the Emotion Awareness Questionnaire for children. *Personality and Individual Differences*, 43, 95-105.
- Rieffe, C., Meerum Terwogt, M., & Smit, C. (2003). Deaf children on the causes of emotions. *Educational Psychology*, 23, 159-168.
- Rieffe, C., Oosterveld, P., Miers, A.C., Meerum Terwogt, M., & Ly, V. (2008). Emotion awareness and internalizing symptoms in children and adolescents: The Emotion Awareness Questionnaire revised. *Personality and Individual Differences*, 45, 756-761.
- Ritakallio, M., Kaltiala-Heino, R., Kivivuori, J., & Rimpelä, M. (2005). Brief report: Delinquent behaviour and depression in middle adolescence: a Finnish community sample. *Journal of Adolescence*, 28, 155-159.
- Rook, K. (2001). Emotional health and positive versus negative social exchanges: A daily diary analysis. *Applied Developmental Science*, 5, 86-97.
- Rose, A.J., & Rudolf, K.D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, 132, 98-131.
- Rubin, K. H., Bukowski, W., & Parker, J. G. (2006). Peer interactions, relationships, and groups. In W. Damon, R.M. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology: Vol. 3, Social, emotional, and personality development* (pp. 571-645). New York: Wiley.
- Sattler, J.M. (1992). *Assessment of children* (3rd ed.). San Diego, CA: Author.
- Scherer, K.R. (2000). Emotion. In: M. Hewstone & W. Stroebe (Eds.), *Introduction to social psychology: A European perspective* (pp. 151-191). Oxford, UK: Blackwell.
- Segerstrom, S.G., & Miller, C.E. (2004). Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. *Psychological Bulletin*, 130, 601-630.
- Selfhout, M.H.W., Branje, S.J.T., & Meeus, W.H.J. (2008). The development of delinquency and perceived friendship quality in adolescent best friendship dyads. *Journal of Abnormal Child Psychology*, 36, 471-485.

- Selfhout, M.H.W., Branje, S.J.T., & Meeus, W.H.J. (2009). Developmental trajectories of perceived friendship intimacy, constructive problem solving, and depression from early to late adolescence. *Journal of Abnormal Child Psychology*, 37, 251-264.
- Semel, E., Wiig, E.H., & Secord, W.A. (1987). *CELF: Clinical Evaluation of Language Fundamentals - revised*. San Antonio, TX.
- Shelton, K.K., Frick, P.J., & Wooton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology*, 25, 317-329.
- Sherman, M., & Le Cessie, S. (1997). A comparison between bootstrap methods and generalized estimating equations for correlated outcomes in generalized linear models. *Communications in Statistics - Simulation and Computation*, 26, 901-925.
- Siemer, M., Mauss, I., & Gross, J.J. (2007). Same situation-Different emotions: How appraisals shape our emotions. *Emotion*, 7, 592-600.
- Sireci, S.G., Patsula, L., & Hambleton, R.K. (2005). Statistical methods for identifying flaws in the test adaptation process. In R.K. Hambleton, P.F. Merenda, & C.D. Spielberger (Eds.), *Adapting educational and psychological tests for cross-cultural assessment* (p. 93-116). Mahwah, NJ: Lawrence Erlbaum Associates.
- Slot, N., & Spanjaard, H. (1996). Ontwikkelingstaken voor ouders van jonge kinderen. Het competentiemodel en gezinsgerichte hulpverlening. *Jeugd en samenleving*, 1, 3-19.
- Smith, R.L., & Rose, A.J. (2011). The "cost of caring" in youths' friendships: Considering associations among social perspective-taking, co-rumination, and empathetic distress. *Developmental Psychology*, 47, 1792-1803.
- Spence, S.H., De Young, A., Toon, C., & Bond, S. (2009). Longitudinal examination of the associations between emotional dysregulation, coping responses to peer provocation, and victimisation in children. *Australian Journal of Psychology*, 61, 145-155.
- Stein, N.L., & Trabasso, T. (1989). Children's understanding of changing emotional states. In: C. Saarni & P. L. Harris (Eds.), *Children's understanding of emotion* (pp. 50-80). Cambridge: Cambridge University Press.
- Stevenson, J., McCann, D., Watkin, P., Worsfold, S., & Kennedy, C. (2010). The relationship between language development and behavior problems in children with hearing loss. *Journal of Child Psychology and Psychiatry*, 51, 77-83.
- Stinson, M.S., & Kluwin, T.N. (2011). Educational consequences of alternative school placements. In: M. Marschark, & P.E. Spencer (Eds.), *Oxford handbook of deaf studies, language, and education* (pp. 47-62) New York: Oxford University Press.
- Stinson, M.S., & Liu, Y. (1999). Participation of deaf and hard of hearing students in classes with hearing students. *Journal of Deaf Studies and Deaf Education*, 4, 191-202.

- Supple, A.J., Aquilino, W.S., & Wright, D.L. (1999). Collecting sensitive self-report data with laptop computers: Impact on the response tendencies of adolescents in a home interview. *Journal of Research on Adolescence*, 9, 467-488.
- Swearer, S.M., & Espelage, D.L. (2004). Introduction: A social-ecological framework of bullying among youth. In D.L. Espelage & S. M. Swearer (Eds.), *Bullying in American schools* (pp. 1-12). Mahwah, NJ: Erlbaum.
- Sweeting, H., & West, P. (2001). Being different: correlates of the experience of teasing and bullying at age 11. *Research Papers in Education*, 16, 225-46.
- Tellegen, P., & Laros, J. (1993). The Construction and Validation of a Nonverbal Test of Intelligence: the revision of the Snijders-Oomen tests. *European Journal of Psychological Assessment*, 9, 147-157.
- Theunissen, S.C.P.M., Rieffe, C., Kouwenberg, M., Soede, W., Briaire, J.J., & Frijns J.H.M. (2011). Depression in hearing-impaired children. *International Journal of Pediatric Otorhinolaryngology*, 75, 1313-1317.
- Theunissen, S.C.P.M., Rieffe, C., Kouwenberg, M., De Raeve, L., Soede, W., Briaire, J.J., & Frijns, J.H.M. (2012). Anxiety in children with hearing aids or cochlear implants, compared to normally hearing controls. *Laryngoscope*, 122, 654-659.
- Theunissen, S.C.P.M., Rieffe, C., Kouwenberg, M., De Raeve, L.J.I., Soede, W., Briaire, J.J., & Frijns, J.H.M. (submitted). Behavioral problems in hearing-impaired children: the influence of sociodemographic, linguistic, and medical factors.
- Theunissen, S.C.P.M., Rieffe, C., Briaire, J.J., Soede, W., Kouwenberg, M., & Frijns, J.H.M. (submitted). Self-esteem in hearing-impaired children: the influence of educational, communicational, and medical factors.
- Torsheim, T., Aaroe, L.E., & Wold, B. (2001). Sense of coherence and school-related stress as predictors of subjective health complaints in early adolescents: Interactive, indirect or direct relationships? *Social Science and Medicine*, 53, 865-871.
- Traxler, C. (2000). The Stanford Achievement Test, 9th edition: National norming and performance standards for deaf and hard-of-hearing students. *Journal of Deaf Studies and Deaf Education* 5, 337-48.
- Tresh, J. (2004). In the face of force: Helping deaf children cope. *Odyssey*, 5, 36-38.
- Underwood, M.K., & Buhrmester, D. (2007). Friendship features and social exclusion: An observational study examining gender and social context. *Merrill-Palmer Quarterly*, 53, 412-438.
- Vaccari, C., & Marschark, M. (1997). Communication between parents and deaf children: Implications for social-emotional development. *Journal of Child Psychology and Psychiatry*, 38, 793-801.

- Van Aken, C., Junger, M., Verhoeven, M., Van Aken, M.A.G., & Deković, M. (2007). The interactive effects of temperament and maternal parenting on toddlers' externalizing behaviours. *Infant and Child Development*, 16, 553-572.
- Van Eldik, T. (2005). Mental health problems of Dutch youth with hearing loss as shown on the youth self report. *American Annals of the Deaf*, 150, 11-16.
- Van Eldik, T., Treffers, T.P., Veerman, J.W., & Verhulst, F.C. (2004). Mental health problems of deaf Dutch children as indicated by parents' responses to the child behavior checklist. *American Annals of the Deaf*, 148, 390-395.
- Van Gent, T., Goedhart, A.W., Hindley, P.A., & Treffers, P.D.A. (2007). Prevalence and correlates of psychopathology in a sample of deaf adolescents. *Journal of child psychology and psychiatry*, 48, 950-958.
- Van Gent, T., Goedhart, A.W., Knoors, H.E.T., Westenberg, P.M., & Treffers, P.D.A. (2012). Self-concept and ego development in deaf adolescents: A comparative study. *Journal of Deaf Studies and Deaf Education*, 17, 333-351.
- Van Gent, T., Goedhart, A., & Treffers, P. (2011). Self-concept and psychopathology in deaf adolescents: preliminary support for moderating effects of deafness-related characteristics and peer problems. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 52, 720-728.
- Van Voorhees, B.W., Paunesku, D., Kuwabara, S.A., Basu, A., Gollan, J., Hankin, B.L., Melkonian, S., & Reinecke, M. (2008). Protective and vulnerability factors predicting new-onset depressive episode in a representative of US adolescents. *Journal of Adolescent Health*, 42, 605-616.
- Veenstra, R., Lindenberg, S., Oldehinkel, A.J., De Winter, A.F., Verhulst, F.C., Ormel, J. (2005), Bullying and victimization in elementary schools: a comparison of bullies, victims, bully/victims, and uninvolved preadolescents. *Developmental Psychology*, 41, 672-682.
- Vernberg & Biggs (2010). *Preventing and treating bullying and victimization*. New York, NY: Oxford University Press.
- Vernon, M., & Brown, D.W. (1964). A guide to psychological tests and testing procedures in the evaluation of deaf and hard-of-hearing children. *Journal of Speech and Hearing Disorders*, 29, 414-423.
- Vitaro, F., Boivin, M., & Bukowski, W.M. (2009). The role of friendship in child and adolescent psychosocial development. In K.H. Rubin, W.W. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships and groups* (pp. 568-588). New York, NY: Guilford Press.

- Vostanis, P. (1997). Detection of behavioural and emotional problems in deaf children and adolescents: Comparison of two rating scales. *Child: Care, Health and Development*, 23, 233-246.
- Wallis, D., Musselman, C., & MacKay, S. (2004). Hearing mothers and their deaf children: The relationship between early, ongoing mode match and subsequent mental health functioning in adolescence. *Journal of Deaf Studies and Deaf Education*, 9, 2-14.
- Waters, E., Stuwart-Brown, S., & Fitzpatrick, R. (2003). Agreement between adolescent self-report and parent reports of health and well-being: results of an epidemiological study. *Child: Care, Health and Development*, 29, 501-509.
- Watkin, P.M., & Baldwin, M. (2011). Identifying deafness in early childhood: requirements after the newborn hearing screen. *Archives of Disease in Childhood*, 96, 62-66.
- Wauters, L.N., & Knoors, H.E.T. (2008). Social integration of deaf children in inclusive settings. *Journal of Deaf Studies and Deaf Education*, 13, 21-36.
- Wechsler, D. (1991). *The Wechsler intelligence scale for children (3rd Ed)*. San Antonio, TX: The Psychological Corporation.
- Weiner, M.T., & Miller, M. (2006). Deaf children and bullying: Directions for future research. *American Annals of the Deaf*, 151, 61-70.
- Wellman, H.M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, 72, 655-684.
- Wolters, N., Knoors, H.E.T., Cillessen, A.H.N., & Verhoeven, L. (2011). Predicting acceptance and popularity in early adolescence as a function of hearing status, gender, and educational setting. *Research in Developmental Disabilities*, 32, 2553-2565.
- Wolters, N., Knoors, H.E.T., Cillessen, A.H.N., & Verhoeven, L. (2012). Impact of peer and teacher relations on deaf early adolescents' well-being: Comparisons before and after a major school transition. *Journal of Deaf Studies and Deaf Education*, 17, 463-482.
- Woolfe, T., Want, S.C., & Siegal, M. (2002). Signposts to development: theory of mind in deaf children. *Child Development*, 73, 718-78
- Yoon, P.J. (2011). Pediatric cochlear implantation. *Current Opinion in Pediatrics*, 23, 346-50.
- Zeman, J., Shipman, K., & Suveg, C. (2002). Anger and sadness regulation: Predictions to internalizing and externalizing symptoms in children. *Journal of Clinical Child and Adolescent Psychology*, 3, 393-398.
- Zins, J.E., Weissberg, R.P., Wang, M.C., & Walberg, H.J. (Eds.) (2004). *Building academic success on social and emotional learning: What does the research say?* New York: Teachers College Press.



Publications

Kouwenberg, M., Rieffe, C. Theunissen, S.C.P.M., & Rooij, M. de (2012). Peer victimization experienced by Children and Adolescents who are Deaf or Hard of Hearing. *PLOS ONE*, 7(12), e52174. doi:10.1371/journal.pone.0052174

Kouwenberg, M., Rieffe, C., & Banerjee, R.A. (2012). A short and balanced Best Friend Index for children and adolescents. *European Journal of Developmental Psychology*. doi: 10.1080/17405629.2012.707780

Kouwenberg, M., Rieffe, C. Theunissen, S.C.P.M., & Oosterveld, P. (2012). Pathways underlying somatic complaints in children and adolescents who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education*, 17, 319-332.

Kouwenberg, M., Rieffe, C., & Theunissen, S.C.P.M. (2011). Intrapersonal and Interpersonal factors related to self-reported symptoms of depression in DHH youth. *International Journal of Mental Health and Deafness*, 1, 46-57.

Kouwenberg, M., Theunissen, S.C.P.M., Briare, J.J., Soede, W., Frijns, J.H.M., & Rieffe, C. (2011). Friends and bullies of youth with implants. *International Journal of Pediatric Otorhinolaryngology*, 75 (suppl. 1), pp. 66.

Kouwenberg, M., Theunissen, S.C.P.M., Soede, W., Briare, J.J., Rieffe, C., & Frijns, J.H.M. (2011). Somatic complaints in youth with CI. *International Journal of Pediatric Otorhinolaryngology*, 75 (suppl. 1), pp. 62.

Theunissen, S.C.P.M., Rieffe, C., **Kouwenberg, M.**, De Raeve, L., Soede, W., Briare, J.J., & Frijns, J.H.M. (2012). Anxiety in children with hearing aids or cochlear implants, compared to normally hearing controls. *Laryngoscope*, 122, 654-659.

Rieffe, C., Theunissen, S.C.P.M., & **Kouwenberg, M.** (2012). Depressieve symptomen bij jongeren met gehoorverlies; samenhang met inzicht in eigen en andermans emoties. *Van Horen Zeggen, periodiek van de VEDON en de VeBOSS*, 53,10-18.

Theunissen, S.C.P.M., Rieffe, C., **Kouwenberg, M.**, Soede, W., Briare, J.J., & Frijns, J.H.M. (2011). Depression in hearing-impaired children. *International Journal of Pediatric Otorhinolaryngology*, 75, 1313-1317.

Rieffe, C., **Kouwenberg, M.**, Scheper, I., Wiefferink, C.H., & Smit, C (2009). Inzicht in de eigen emoties bij dove kinderen. *Van Horen Zeggen, periodiek van de VEDON en de VeBOSS*, 50, 10-14.



Curriculum Vitae

Maartje Kouwenberg was born on the 9th of July in The Hague, the Netherlands. She graduated from the Erasmus College Zoetermeer in 1999. In 2004 she received her Master's degree in Linguistics at the University of Utrecht. Two years later, in 2006 she received her Master's degree in Neuroscience at the University of Utrecht, specializing in Cognitive Neuroscience. As part of the program, she carried out an internship at University College London under supervision of Professor Ruth Campbell. In this study, she investigated brain activation of hearing individuals who were sign language users. After finishing this master, she proceeded with sign language and successfully completed the first year of the study for Dutch Sign Language interpreter at the University of Applied Sciences Utrecht. In 2008, she published a review concerning the use of sign supported language by children with speech and language impairments, on behalf of PonTeM. In September 2008, Maartje started her PhD research on the social and emotional functioning of children and adolescents who were deaf or hard of hearing, which was supervised by Professor Carolien Rieffe. The main themes of her research were the internalizing problems and peer relations of deaf or hard of hearing youth as compared to their hearing counterparts. Maartje is currently working as an editor in The Hague.

