Published in final edited form as:

Am Ann Deaf. 2018 ; 162(5): 463–478. doi:10.1353/aad.2018.0004.

Exploring the social capital of adolescents who are deaf or hard of hearing and their parents: A preliminary investigation

Cara L. Wong^{*,1,2}, Teresa Y.C. Ching¹, Jessica Whitfield¹, and Jill Duncan³

¹National Acoustic Laboratories, HEARing CRC

²Macquarie University

³University of Newcastle

Abstract

The aims of this study were to explore the social capital of Australian adolescents who are deaf or hard of hearing (DHH) and their parents, and investigate its relationship with individual child or family characteristics, language, literacy, and psychosocial outcomes. Participants of the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study were invited to complete an online questionnaire. The survey included an adapted version of the Looman Social Capital Scale (LSCS), the Family Empowerment Scale (FES), and questions on psychosocial outcomes. Responses from 16 adolescents (aged 11–14 years) and 24 parents were received. Information about demographic characteristics, language and literacy outcomes of the adolescents were retrieved from the LOCHI study database. On average, parent-rated social capital was positively related to adolescent-rated social capital. Higher parent-reported social capital was related to younger age of adolescent, but not to their outcomes. Higher adolescent-reported social capital was reported in those with no additional disabilities. Aspects of adolescent-reported social capital were significantly related to their language and reading skills, but not with psychosocial outcomes. This study gives support for the promotion of social capital in adolescents who are DHH and their families, and considers how this could be applied in interventions.

Keywords

deaf or hard of hearing; adolescence; social capital; empowerment; language; literacy; psychosocial

Introduction

There has been growing interest in the study of social capital in the education, health, and disabilities fields. Social capital has been suggested to explain inequalities in population and individual health (Pearce & Davey Smith, 2003), and play an important role in supporting and connecting young people with disabilities in mainstream education settings (Allan, Smyth, I'Anson, & Mott, 2009). Although various definitions exist, social capital can be

*Correspondence: National Acoustic Laboratories, Level 4, Australian Hearing Hub, 16 University Avenue, Macquarie University, NSW 2109, Australia. Tel.: +61 2 94126783; Fax: +61 2 94126769; Cara.Wong@nal.gov.au.

broadly defined as the benefit people derive from personal relationships and networks which yield positive outcomes such as emotional support and exchange of ideas and resources (Bourdieu, 2011; Coleman, 1988; Paldam, 2000; Putnam, 2000). Consequently, social capital may also be useful for explaining differences in developmental outcomes for children and adolescents who are deaf or hard of hearing (DHH). As social capital includes the concepts of trust, cooperation, and networking (Paldam, 2000), it may rely heavily on language and communication – skills that are problematic for many individuals who are DHH (Ching, Dillon, et al., 2013; Wilkens & Hehir, 2008; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998).

Social Capital and Outcomes in Youth

In the hearing population, social capital has been positively related to indices of youth psychological and educational outcomes including self-esteem, satisfaction with life, mental health, overall health status, and school achievement (Dika & Singh, 2002; Drukker, Kaplan, Feron, & Van Os, 2003; Israel, Beaulieu, & Hartless, 2001; Rothon, Goodwin, & Stansfeld, 2012; Steinfield, Ellison, & Lampe, 2008; Ziersch, 2005). For example, Yamaguchi (2013) found a strong and positive correlation between social capital (as measured by several indices e.g., whether adolescents received help when in trouble, participated in groups/clubs, and accessed community resources) and psychological well-being in adolescents. They found that social capital independently predicted 38% of the variance in psychological well-being, and was still significant after controlling for family and adolescent characteristics. Social relationships are thought to act as a buffer against stress, illness and psychological distress by providing support, care and assistance, as well as enhancing coping strategies (Kawachi & Berkman, 2001; Stafford, De Silva, Stansfeld, & Marmot, 2008).

In a review of the literature on social capital and educational outcomes (Dika & Singh, 2002), social capital has been associated with high school graduation, fewer dropouts, college enrollment, higher academic achievement and homework effort. However, measures of social capital varied greatly across the studies reviewed and mainly included family/parent variables such as family structure, number of moves, involvement in activities/church, parental involvement/monitoring, parent-child relationship, and parent expectations. Dika and Singh (2002) reported there may have been a misapplication of the concept of social capital to refer to social norms rather than access to resources. Investigations of social capital in adolescents should also focus on interactions within the adolescents' own networks, not only in the family but also outside, such as in the school, neighborhood and community settings (Dika & Singh, 2002; Morrow, 1999).

Schools are the most dominant extra-familial institution in childhood and adolescence (Crosnoe, 2004). Supportive ties within schools are thought to be a necessary condition for engagement and advancement in the educational system, and ultimately the workforce (Stanton-Salazar & Dornbusch, 1995). Stanton-Salazar and Dornbusch (1995) investigated the social capital of minority high school students in the US and found that school-based social capital (measured as the number of ties or access to personnel within the school domain) was positively related to socioeconomic status (SES) and English proficiency. English proficiency had the strongest effect on social capital. In contrast they did not find

that social capital was related to better school grades; however, grades were self-reported so may not have been reliable. It was suggested that children with better language skills were more likely to seek help and build beneficial personal networks to assist them in the educational system. This likely has applications for youth who are DHH who may also have challenges with language and communication.

Adolescence is also a time of increasing independence and autonomy, with more time being spent away from the family and school (Drukker et al., 2003). Outside of the family and school, researchers have also focused on social capital in the local community or neighborhood context. Previous research measuring community-level social capital have encompassed concepts of trust and reciprocity within the neighborhood, community participation, and collective efficacy (Drukker et al., 2003; Onyx & Bullen, 2000; Sampson, Morenoff, & Earls, 1999). Drukker and colleagues (2003) found that a specific aspect of 'neighborhood social capital' or collective efficacy (e.g. willingness to intervene in neighborhood situations for the common good) in a Dutch community was associated with children's mental health and behavior.

Chenoweth and Stehlik (2004) reported on how social capital in community settings might specifically apply to people with disabilities. They found that many individuals/family members expressed they did not feel part of the local community; were fighting for funding and support; often exposed to bullying, social exclusion and violence; and often felt like their contributions to society were invisible. Beyond the school and neighbourhood, families of children with disabilities may need to build relationships with other specific community services, such as healthcare services and other families with similar disabilities. Chenoweth and Stehlik (2004) concluded that social capital has the potential for informing policy and practice on community building, social networks and inclusion for people with disabilities; but building bonds, bridges and links would require additional support for this population.

Social Capital and Outcomes in DHH Youth

Social capital is an outcome of social behaviour, which in turn is a predictor of peer status and a determinant of wellbeing (Wolters, Knoors, Cillessen, & Verhoeven, 2012).

Adolescents who are DHH have weaker social skills than their hearing peers (Luckner, 2011). An understanding of adolescent social skills attainment, particularly in complex social situations, would enable teachers to better assist their students (Cawthon, Caemmerer, Dickson, Ocuto, Ge, & Bond, 2015). However, very little is known about the social capital of adolescents who are DHH. Many of them may face challenges developing age-appropriate language, communication (Ching et al., 2010) and social skills (Batten, Oakes, & Alexander, 2014; Hoffman, Quittner, & Cejas, 2015), which are crucial for building social capital (Stanton-Salazar & Dornbusch, 1995). Wilkens and Hehir (2008) discussed deaf education in the framework of social capital theory, and concluded that promotion of social capital, in particular increasing 'bridging' (i.e. the resources accessed through 'weak ties' or networks outside one's social milieu) and 'linking' social capital (i.e. the resources accessed through relationships with formal or institutionalized power or authorities) should be focused on in educational programs to improve outcomes, particularly for students making the transition out of school into the workforce or tertiary education.

In a recent pilot study (Wong, Ching, Whitfield, & Duncan, 2016), we investigated the online social habits, social capital and literacy in a sample of 29 Australian adolescents who are DHH (aged 11–18 years). The results of the study showed that an online self-report survey was feasible to collect data on online participation and social capital in adolescents, but not reliable for collecting literacy outcomes. A significant positive relationship was found between hours of internet use and one aspect of online social capital - ‘bridging’ social capital suggesting that the internet assists teenagers to connect with others outside their immediate networks and expand their worldviews. The findings were consistent with a previous study in adolescents who are DHH, showing a positive association between higher levels of internet use and well-being and empowerment (Barak & Sadovsky, 2008). In contrast, the pilot study did not find a significant relationship between internet use and ‘bonding’ social capital (i.e. the resources accessed through ‘strong ties’ or close networks such as friends and family), which indicates that internet-based interactions still cannot substitute face-to-face interactions for social/emotional support. Due to the small sample size and unreliability of self-reported literacy scores, associations between social capital and literacy could not be determined. In addition, the social capital measure used - Internet Social Capital Scale (Williams, 2006), was not designed for adolescents and did not allow for the investigation of social capital in various contexts that may be relevant for adolescents who are DHH, such as the school, family, community and healthcare services.

Measuring Social Capital

As mentioned, social capital has a broad definition and subsequently has been difficult to operationalize. Its measurement varies between disciplines and the definition used (Morrow, 1999). A relatively recent study by Paiva et al. (2014), reported there were 31 social capital assessment tools for adults, and only one (developed by the authors) for use in children and adolescents. As such, no scale is considered the ‘gold standard’ for evaluating social capital.

Social capital has sometimes been measured as the actual social networks formed that yield positive outcomes, rather than the outcomes (i.e. resources/opportunities) themselves (Williams, 2006). As such, the confusion of the source with the benefits leads to circular reasoning (Dika and Singh, 2002). Many researchers argued that social capital is a feature of the social structure rather than the individual actors within the social structure, and is thereby distinct from the concept of social networks and support (Coleman, 1988; Putnam, 2000;). Measures that focus on the quantity (i.e. number of ties) of social capital are poor and unreliable indicators as they do not give information about relationship dynamics or the quality of resources accessed (Dika & Singh, 2002). This problem is highlighted in modern society with the increasing use of online social networking. An adolescent, for example, could have a large network of friends online, but no close friends they could turn to when they needed help.

Morrow (1999) critically reviewed the relevance of social capital to children and adolescents’ health and provided a framework for its measurement. She emphasized the multidimensional nature of social capital and that it is more useful to examine how different types of social capital effect outcomes within the everyday context of children’s lives (i.e. school, family and neighborhood). Three domains of social capital were highlighted that are

relevant to children and young people - 1) sense of belonging, i.e. integration in the community, 2) social networking, i.e. participation and socialization in school and community life, and 3) sense of self-efficacy and control, i.e. perceptions of power/autonomy to influence family, community or institutional decisions. Unfortunately, there is no one measure that appears to cover these domains. In addition, the majority of studies investigating children also use parent-report, rather than the child's self-report, which may undermine the child's agency and overemphasize the influence of the parent (Morrow, 1999). For adolescents it seems evident that both the perspective of the parent and adolescent should be examined in regards to their social capital, and further, whether parent social capital is related to their child's social capital.

Two measures were identified that tap into the domains suggested by Morrow (1999). Firstly, the Looman Social Capital Scale (LSCS) was developed specifically for caregivers of children with special health care needs (Looman, 2006). This scale includes questions about sense of belonging in the community and healthcare system, common good in the community, information/help seeking, and connections with school, and religious/spiritual groups. It therefore covers the first two aspects of Morrow's domains within the everyday context of children's lives. The areas covered in the LSCS were also thought to be particularly relevant to adolescents who are DHH and their families. For example, sense of belonging may be relevant for adolescents who are DHH, as previous research has found that majority of them do not identify themselves as having a hearing disability, and many experience more loneliness than their hearing peers (Kent, 2003). In addition, the adolescents' language and communication abilities may impact on their abilities to seek information, and to access additional school resources to support learning in the school environment.

The second measure was the Family Empowerment Scale (FES) (Koren, DeChillo, & Friesen, 1992) that measures aspects of self-efficacy, control and ability to influence others in the family, service system and community/political contexts – which are related to Putnam's (2000) concepts of bonding, bridging and linking social capital. The FES was thought to be particularly relevant for adolescents who are DHH and their families due to its focus on relationships with professionals in the service system. Parents of children with disabilities also need to be able to negotiate service delivery systems, work collaboratively with professionals and advocate for their child's needs (Koren et al., 1992; Resendez, Quist, & Matshazi, 2000). As both of the LSCS and FES are designed for parents only, these were adapted to use for both parent and adolescent self-report in the current study.

Although the FES is not typically used as a 'social capital' measure, the concept of empowerment overlaps greatly. In particular, it is similar to the concepts of proactivity in social contexts, 'collective efficacy' or political action that have previously been used in measures of social capital (Grootaert, 2004; Lochner, Kawachi, & Kennedy, 1999; Narayan & Cassidy, 2001). Stanton-Salazar (2011) suggested that social capital is embedded in the process of empowerment, where empowerment social capital can be seen as the resources and institutional support that come from connections/relationships with high-status, resourceful institutional agents (e.g., school counselors, health professionals, community leaders) who have the potential to counter established social structures.

Aims

The aims of the current study were to explore the social capital of adolescents who are DHH and their parents. The specific research questions were: 1) is adolescent-reported social capital related to parent-reported social capital? 2) Are parent- and/or adolescent-reported social capital related to individual child or family characteristics (e.g., age, additional disabilities, severity of hearing loss, SES, maternal education)? 3) Are parent- and/or adolescent-reported social capital related to adolescents' language and literacy outcomes? 4) Are parent- and/or adolescent-reported social capital related to adolescents' psychosocial outcomes?

Methods

Participants

Adolescents who are DHH and their parents who enrolled in the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study served as the sampling frame. The LOCHI study is a population-based, longitudinal study that has prospectively measured the language, psychosocial and educational outcomes of a large cohort of DHH children in Australia. Detailed information about the LOCHI study has been presented previously by Ching and colleagues (2013). In brief, families with children born between May 2002 and August 2007 in the Australian states of New South Wales, Victoria and Queensland who were identified with hearing loss and fitted with amplification before 3 years of age were invited to participate in the LOCHI study. All children in the LOCHI study had access to the same hearing service provider (Australian Hearing) before 3 years of age. At commencement of this sub-study on social capital, there were 96 children from the LOCHI study who fell between the ages of 11–14 years and had completed a language assessment at 9 years of age. Letters of invitation were sent to these families, to seek informed consent from parents for themselves and their child to participate in the survey. The invitation letter included a link to the parent and adolescent online questionnaire, and families were told that by completing the survey they indicated their consent to participate. Twenty-four parents and 16 adolescents completed the survey. The study was approved by the institutional human research ethics committee.

Measures

The online survey included measures of social capital and child psychosocial outcomes each discussed in detail below. In addition, information about child's first name, date of birth and gender were collected to match participants with retrospective data from the LOCHI study. Readability analyses were carried out on the parent and adolescent versions of the questionnaires. The Flesch-Kincaid readability analysis showed that both versions were at a Grade 6 reading level.

Social Capital Measures

Looman Social Capital Scale (LSCS) – Parent and Adolescent Rated: The LSCS (Looman, 2006) was adapted to measure parents and adolescents' networking and sense of belonging in school, community and healthcare settings. The original 20-item LSCS

includes domains of sense of belonging (e.g., ‘my child spends time with people outside our family’, ‘my child’s health is important to the community’), common good (e.g., ‘We work with other families like our own to help the community understand my child’s needs’), religious/spiritual community (e.g., “We participate in activities through a church or place of worship”), school connection (e.g., ‘If I needed help from the school system we know how to get it’) and information/help seeking (e.g., ‘We usually ask for help when I need it’). In the current study, the religious/spiritual questions from the original scale were removed as it was assumed not all families would be involved in these groups and that inclusion of those questions might inflate total scores for families who were involved in religious factions. The adolescent version was re-worded to use more simple and concrete language (e.g., ‘I spend time with people outside our family’; ‘If I had a problem at school I would know who to talk to’, ‘If I was sick I can get the health care I need e.g., from doctors, hospitals, audiologists etc.’). All questions were answered on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The item scores were averaged into subdomains and also combined to create a ‘total score’. Higher scores indicate higher social capital. The original LSCS development study found the scale to have good psychometric properties including high test-retest reliability ($r = .9$), internal consistency (Cronbach’s $\alpha = .84$) and construct validity (evaluated through factor analysis and correlation with other measures) (Looman, 2006). The scale has also been found to be reliable and valid in other cultural populations (Looman & Farrag, 2009). As this was the first time using this scale on an adolescent population, reliability analyses were carried out. The Cronbach’s α of the adolescent version was .729 indicating adequate internal consistency and reliability.

Family Empowerment Scale (FES) – Parent and Adolescent Rated: The FES (Koren et al., 1992) is a 34-item parent-rated scale designed to measure empowerment in parents and caregivers of children with emotional disabilities. It measures empowerment at 3 levels - the family, service system and community/political levels. Family-level empowerment refers to a family’s management of day-to-day situations in the immediate family context (e.g., “I feel my family life is under control”, “I make efforts to learn new ways to help my child grow and develop”). Service-level empowerment refers to how parents/caregivers work with the system of professionals and agencies that provide services to their child (e.g., “I know what services my child needs”, “I tell professionals what I think about services being provided to my child”). Community/political-level empowerment refers to parental advocacy for improving services for children with special needs, targeting legislative bodies, policy-makers, administrative agencies and community members (e.g., “I tell people in agencies and government how services for children can be improved”). The items were reworded and adapted for the adolescent version (e.g., “I feel that I have a right to say which services I receive”) and the community/political level questions were removed as these questions were too complex and irrelevant for adolescents. All questions were answered on a 5-point Likert scale from 1 (not true at all) to 5 (very true). Higher scores indicate higher feelings of empowerment. The original FES development study found the scale to have good psychometric properties including high test-retest reliability ($r = .77$ to $.85$), internal consistency ($\alpha = .87$ to $.88$) and construct validity (evaluated through factor analysis and rater agreement) (Koren et al., 1992). The psychometric properties have been supported in other populations including children with disabilities (Akey, Marquis, & Ross, 2000) and attention

deficit/hyperactivity disorder (Singh et al., 1995). Reliability analyses for the new adolescent version showed high internal consistency (Cronbach's $\alpha = .886$).

Psychosocial Outcome Measures

Loneliness and Social Satisfaction Questionnaire (LLSQ) – adolescent-rated: This is a 10-item scale adapted from Cassidy and Asher (1992) to assess self-reported feelings of loneliness and social satisfaction with peers in children. The items include questions about social adequacy (e.g., “Is it easy for you to make friends?”), loneliness (e.g., “Do you feel left out?”) and peer status (e.g., “Do you have a lot of friends?”). All items are rated on a 3-point scale of ‘no’, ‘sometimes’, and ‘yes’. Higher scores indicate higher social satisfaction and less loneliness. The authors reported satisfactory internal consistency reliability ($\alpha=.79$) and validity (evaluated via factor analysis and correlational analyses with behavioral ratings) (Cassidy & Asher, 1992).

Social Competence with Peers – parent-rated: This is a 9-item parent-rated scale adapted from Spence (1995) to measure their child's social competence with peers. The questions assess the consequences of children's interactions with peers, existence and duration of friendships and invitations to other children's parties or homes. Items are on a 3-point scale of ‘not true’, ‘sometimes true’, and ‘mostly true’. Higher scores indicate better social competence. The scale was shown to have good psychometric properties including good internal reliability (Guttman split-half reliability=.87, Cronbach's $\alpha=.87$) and validity (based on factor analysis and correlation with teacher ratings and behavioral ratings) (Spence, 1995).

Procedure

An online survey comprising the scales described above was implemented via Survey Gizmo. Each participant accessed the survey using the provided link. Parents and adolescents were identified only by their first name and adolescent's date of birth so researchers could match these with data collected previously from the LOCHI study. Once completed, the survey results were sent to the investigators. Participants who completed the survey went into a draw to win an iPad or Westfield voucher for their participation.

The data collated from the LOCHI study included demographic information on the child (presence of additional disabilities, severity of hearing loss, communication mode, hearing device) and family (maternal education and SES), as well as outcome data from direct assessments of language (Clinical Evaluation of Language Fundamentals [CELF] –4), literacy (Woodcock-Johnson Diagnostic Reading Battery [WDRB]) and non-verbal cognitive ability (Wechsler Non-Verbal Scale of Ability [WNV]) at 9 years of age. The CELF-4 includes subscales of expressive language, receptive language, and language memory; and subscales are combined to give a ‘core language’ score. The WDRB includes measures of letter word identification, passage comprehension and nonsense word reading. These subscales are combined to give a ‘basic reading’ score.

Analyses

The data were analyzed using SPSS Statistics Package 21. Descriptive analyses were used to summarize the data. Paired sample t-tests were used to explore within-group differences on subscales of social capital, as well as differences between parent and adolescent dyads. Spearman Rho correlations were used to look at relationships between parent and adolescent social capital with demographics, empowerment and child language and psychosocial outcomes; and relationship between parent and adolescent-ratings from dyads. Non-parametric tests (Kruskal-Wallis H tests) were used to explore group differences.

Results

A total of 24 completed questionnaires were received by parents and 16 questionnaires by adolescents. All of the adolescents except for 2, had a parent who also completed the questionnaire. Consequently, there were 14 parent-adolescent dyads who completed both the questionnaires. There was one adolescent and her parent who completed the questionnaires who were not enrolled in the LOCHI study so demographic and language/literacy data were not available for this pair.

Participant Characteristics and Demographics

Table 1 below presents the child and family characteristics of the adolescents who are DHH and parents who completed the questionnaire. For the parent-report questionnaire, all except 1 respondent was female. For the adolescent respondents, there were 8 females and 8 males. There were more adolescents who had hearing aids (HA) compared to cochlear implants (CIs), and the adolescents had a range of severities of hearing losses. The majority of adolescents did not have additional disabilities (75%). All participants except for 2 adolescents used spoken English only as their mode of communication. The remaining used a combination of speech and sign. The majority of parent respondents (54%) had completed a university qualification, and 62.5% of adolescent respondents had mothers who had completed a university degree. On average, adolescents had nonverbal cognitive ability (WNV) and reading (WDRB) scores within the average range. Language ability (CELF-4) also fell within the average range, although it was close to 1 standard deviation below the norm (mean standard score = 86.57, SD=18.76).

Parent and Adolescent-Reported Social Capital

Table 2 summarizes the domain and total scores for the LSCS and FES for parent and adolescent-ratings. On average, both parents and adolescents rated fairly high social capital (i.e., mean rating ~4 out of 5) in regards to their sense of belonging, school connection, ability to ask for information/help, and empowerment at the family and service level. In contrast, parents and adolescents rated their 'collective action' in the community to be relatively lower (mean ratings ~2.5 out of 5) including questions relating to 'common good' on the LSCS (e.g., helping others in the community to understand their needs), and community/political level empowerment for parents (e.g., helping other families get services they need, tell people in agencies/governments how services can be improved) on the FES.

Relationship between Parent and Adolescent Dyads—When looking at differences in social capital domains between parents and adolescent dyads, the only significant difference was for the FES services domain where parents rated higher control/power over the services their child received, compared to how the child rated their own control/power of the services they received ($t=-4.95$, $p<.001$). Investigation of correlations between the 14 pairs of parent and adolescent dyads are shown in Table 3 below. The results showed that higher parent-rated sense of belonging was significantly related to higher adolescent-rated sense of belonging ($r=.605$, $p=.022$), and higher parent-rated school connection was also related to higher adolescent-reported information/asking ($r=.520$, $p=.018$). Surprisingly, parent-rated common good was significantly negatively related to adolescent-rated school connection and FES total, however, examination of scatterplots showed this is likely due to a single outlier. Higher rated parent-rated family empowerment (FES family) was also associated with significantly higher adolescent rated FES total scores ($r=.633$, $p=.027$). Higher parent-rated service empowerment was associated with all domains of adolescent-rated empowerment including FES family ($r=.601$, $p=.03$), services ($r=.665$, $p=.013$) and total scores ($r=.707$, $p=.01$) as well as LSCS sense of belonging ($r=.637$, $p=.019$).

Relationship between Social Capital with Child and Family Characteristics—Relationships between child-related (age, gender, presence of additional disabilities, non-verbal cognitive ability [WNV score], hearing device, severity of hearing loss [4FA]) and family-related (maternal education and SES) with parent-reported and adolescent-reported social capital indices were examined and presented in Table 4. For parent-reported social capital, Spearman Rho correlations showed that only younger child's age was significantly related to higher parent-reported LSCS total score ($r=-.441$, $p=.031$). In contrast, presence of disabilities, gender, severity of hearing loss, hearing device, SES and maternal education were not related to any parent-rated social capital measure.

For adolescent-reported social capital, the only significant correlation was between the presence of additional disabilities and LSCS total score ($r=-.597$, $p=.015$), although all domains were negatively correlated with additional disabilities. Adolescents with additional disabilities had significantly lower LSCS total scores. However, there were only 4 adolescents with additional disabilities in this sample. In contrast, age, gender, severity of hearing loss, device, communication mode, SES and maternal education were not significantly related to any adolescent-reported social capital measure.

Relationship between Social Capital and Child Language and Psychosocial Outcomes—Table 5 below shows the correlations between parent- and adolescent-rated social capital subscales with their child's language (CELF-4), literacy (WRDB) and psychosocial outcomes (parent-reported social competence with peers, and adolescent-reported social satisfaction [LLSQ]). There were 21 parents who completed the social capital survey and had a child with completed LOCHI CELF-4 and WRDB data. As seen in Table 4, no measure of parent-rated social capital was significantly related to adolescent language or reading outcomes. Similarly, parent-rated social capital was not related to parent-reported child's social competence, nor with adolescent self-reported loneliness and social satisfaction.

There were 13 adolescents who had self-report social capital and completed LOCHI CELF-4 and WRDB assessments. In contrast to parent-report, literacy and language abilities were significantly related to aspects of adolescent-reported social capital (see Table 5). Better overall language scores (CELF-core) was significantly related to family ($r=.555$, $p=.049$) and service-level ($r=.563$, $p=.045$) domains of empowerment as well as total FES score ($r=.585$, $p=.046$). This was mainly driven by the positive relationship between CELF-expressive language and language memory domains with FES. Expressive language ability was positively related to family ($r=.628$, $p=.022$), service ($r=.688$, $p=.009$) and total empowerment ($r=.684$, $p=.014$). Language memory was significantly related to family ($r=.580$, $p=.038$) and total empowerment ($r=.599$, $p=.04$), and almost reaching significance with FES services ($r=.545$, $p=.054$). Higher reading skills on the WRDB was significantly correlated with higher LSCS total ($r=.684$, $p=.007$), and FES family scores ($r=.751$, $p=.003$).

The data were also examined excluding two outliers - the adolescent with very low scores on the FES and LSCS, and the adolescent with a CELF and WRDB score more than 2SDs below the norms. The significant correlations between CELF-4 expressive language and FES and WRDB and FES family and LSCS total still remained. In addition, CELF-4 receptive language became significantly correlated with FES services ($r=.625$, $p=.04$) and total scores ($r=.657$, $p=.039$).

In contrast, there was no significant relationship between adolescent-reported social capital and self- and parent-reported psychosocial outcomes (see Table 4). However, all correlations were in the expected positive direction with the exception of LSCS common good and information/asking.

Discussion

The aim of this study was to explore the social capital of adolescents who are DHH and their parents and specifically examine: 1) whether the adolescent vs. parent ratings of social capital are related, 2) its relationships with child and family characteristics, 3) adolescents' language and literacy outcomes, and 4) adolescents' psychosocial outcomes. As the sample sizes for parents and adolescents were small, the results are discussed in a descriptive manner. Future studies on a larger sample will be required to examine whether the present findings can be generalized to the wider population of adolescents who are DHH. Nonetheless, the current results provide interesting (albeit preliminary) insight into the social capital of adolescents who are DHH and their families. Each of these aims are discussed in detail below.

The Social Capital of Adolescents who are DHH and their Parents

As discussed in the introduction, measuring social capital has proven somewhat elusive, particularly in regards to children and young people. Morrow's (1999) recommendations were followed by focusing on youth-relevant multi-dimensional social capital domains, including sense of belonging, social networking in school and community life, and self-efficacy and control; and also included both parent and adolescent self-report. Social capital was also explored in a variety of contexts including family, school, services and the community using the Looman Social Capital Scale and the Family Empowerment Scale.

Unfortunately, these scales do not have normative data, and were designed for children with chronic health conditions or emotional disabilities. Therefore, it is not known whether adolescents who are DHH and parents show higher or lower social capital compared to typically developing peers. Nonetheless, we found that higher parent-rated social capital was positively correlated with adolescent social capital. Parents who felt more empowered and had a sense of control over their family and services, had children who were more likely to feel empowered. Parents who had a higher sense of belonging in their community and felt more included were also more likely to have children who felt more sense of belonging. Further, parents who had better connections with their child's school had children who were more likely to generally ask for information/help when they needed it.

On average, the majority of parents and adolescents rated their feelings of social capital as high (i.e., mean ratings ~ 4 out of 5) in the areas of sense of belonging, school connection, family and service empowerment. The only 2 domains that were rated lower (i.e., mean ratings ~ 2.5 out of 5) were in regards to working with others in the community to produce change (LSCS common good) and empowerment at the community/political level (FES community). Both of these domains appear similar at face value (although were not significantly correlated), and suggest that although adolescent and parents in this study report a good sense of belonging within their families and community, they are less likely to take collective action to change or improve the services they receive from agencies/government, work with other families in the community to improve their situation, or raise awareness about their child's condition.

The low rating on common good and empowerment at the political/community level suggests that adolescents who are DHH and their families need to improve bridges with other families, community groups and professional bodies to be able to access resources and informational networks. This is consistent with previous literature in children who are DHH indicating that promotion of bridging social capital is one of the most critical needs in deaf education (Wilkens & Hehir, 2008). In addition, a study found that parents who had more contact with other parents of children with hearing loss or other adults with hearing loss, felt significantly less socially isolated, had stronger and more trusting bonds with their children, and had a stronger sense of competency raising their child (Hintermaier, 2000). Therefore, improving links to other families with hearing loss, services and resources, and empowering families to make decisions or improvements to their services, may be particularly beneficial to improve child outcomes.

The findings also emphasize the importance of collecting both adolescent and parent ratings of social capital. Morrow (1999) reported that previous research on the social capital of youths has tended to take a 'top-down' view of the effect of parents on children, and has downplayed children's agency. However, it is equally important to explore how children/adolescents actively generate and negotiate their own social capital, or even make links for their parents (Morrow, 1999). The current findings showed that despite the positive correlations between parent and adolescent dyads, adolescents felt less empowered regarding their services than their parents. Further, social capital was differentially related to language outcomes depending on the respondent (discussed below), giving further support to obtain both adolescent and parent-report in future studies.

Social Capital and Individual/Family Characteristics

This study examined whether there may be specific child or family-related risk or protective factors for social capital in adolescents who are DHH and their families. Very few factors were found to be significantly correlated with social capital indices. For parent-reported social capital, only adolescent's age was negatively associated with LSCS total score, indicating that parents of younger adolescents rated higher social capital. This may be linked to the fact that many adolescents were transitioning or had recently started high school, where parents may feel that their child is less supported (Zeedyk et al., 2003).

The only factor found to be related to adolescent social capital was the presence of additional disabilities. Adolescents who had additional disabilities to hearing loss rated lower LSCS total scores. Although none of the other correlations reached significance, additional disabilities was negatively related to all domains of social capital. However, the numbers of children who participated in the current study with additional disabilities was relatively small (25%) so this should also be interpreted with care. Nevertheless, this finding is consistent with other studies showing poorer psychosocial outcomes for children and adolescents with hearing loss and additional disabilities (Dammeyer, 2010; Wong, Ching, Leigh, et al., 2016). Children with multiple disabilities may face further difficulties with communication (Knoors & Vervloed, 2003) and consequently, may find it harder to establish relationships, ask for information/help, and be at higher risk for social isolation. No relationship was found between other individual factors and social capital, including gender, age, non-verbal cognitive ability, severity of hearing loss or hearing device.

In contrast to previous research, the current results did not find a significant relationship between parent- or adolescent-rated social capital with SES or maternal education. Maternal education is often used as a proxy for SES, but has been found to be independently related to language outcomes in children who are DHH (Ching et al., 2013). Prior research has reported that certain family characteristics such as SES are associated with social capital, and both contribute to health, psychological and educational outcomes (Dika & Singh, 2002; Emerson & Hatton, 2007; Yamaguchi, 2013). Higher parental SES and education is thought to contribute to social capital by increasing the resources available, consequently facilitating positive child outcomes (Parcel & Menaghan, 1994). Although the current study did not find a significant relationship between social capital and family factors, the sample was small and fairly homogenous. A high proportion of mothers had completed university education (over 50%), and more than half were living in high SES suburbs (i.e., IRSAD 9), which is not representative of the population. Future studies with larger samples and more variability is necessary to explore the relationship between child/family factors and social capital in children who are DHH.

Social Capital and Adolescent Language and Literacy Outcomes

A large body of research has found that children who are DHH have higher rates of language delays, which in turn, has been shown to have a direct impact on peer relations and social skills (Batten et al., 2014; Leigh et al., 2015; Stevenson, McCann, Watkin, Worsfold, & Kennedy, 2010; Wong, Ching, Leigh, et al., 2016). Good communication and relational skills appear to be essential for building social capital (Stanton-Salazar & Dornbusch, 1995),

yet very few researchers have looked at this relationship in adolescents who are DHH (Wong, Ching, Whitfield, et al., 2016). The current results showed that adolescent-reported (but not parent-reported) social capital was significantly related to their language (CELF-4) and literacy (WDRB) outcomes. Interestingly, CELF-4 language scores were only found to be related to the FES scale but not with any domain on the LSCS. However, WDRB reading skills was significantly positively related to domains on both measures including LSCS total, and FES family-level empowerment.

The results indicate that adolescents who are DHH with better language skills have higher feelings of empowerment/control over their family life and services. Good expressive skills are necessary for many of specific items asked in the FES, such as being able to handle and solve problems when they arise at home (family-level), feeling they have a right to say what services they receive, and that professionals understand their opinions (service-level). It was suggested children with better language skills may be more likely to seek help and build beneficial personal networks to assist them in the educational system (Stanton-Salazar & Dornbusch, 1995). The significant relationship between social capital and the 'language memory' domain is somewhat less clear, but potentially suggests that good linguistic attention and working memory are needed to follow and understand complex conversations regarding important decisions. Although the relationship did not quite reach significance for FES services, conversations in these contexts may be primarily between the parents and professionals, so the adolescent may need good receptive language and working memory to understand what is happening as well as form their own opinion. In addition, non-verbal intellectual ability (as measured on the WNV) was not significantly related to any measure of social capital, although it has been previously related to language ability and social skills in a similar DHH population (Cupples et al., 2017; Wong, Ching, Leigh et al., 2016).

Adolescents with better literacy/reading skills also tended to rate themselves as having higher overall social capital on the LSCS, and feeling more empowered in their family life. Good literacy skills are needed to access information and resources, as well as communicate, build and maintain social networks in modern society, e.g., online social media or mobile phone texting (Wong, Ching, Whitfield, et al., 2016). A previous study in adults, found that participation in a literacy intervention led to higher social capital including increased numbers of networks, support sought, ability to negotiate and share information, and increased activities with close ties (Balatti, Black, & Falk, 2006). The mechanisms behind this (other than improved literacy), were thought to include enhanced interpersonal skills (e.g., listening skills, appropriate engagement with authority), confidence and self-efficacy, as well as the social support networks built from attending the group program itself. The link between social capital and language/literacy is likely bi-directional, as students who have higher social capital are more likely to have better language/literacy skills through more rich social participation and connections, educational support/resources and self-efficacy (Ahn, 2011). On the other hand, it is also possible adolescents with better language and literacy skills may have been better able to read and comprehend the survey questions administered.

Overall, the results are promising in suggesting a positive link between adolescent-reported social capital (particularly empowerment) and language/literacy skills. As these findings are based on correlations, the direction of this relationship still needs to be explored in future

research. Nevertheless, the findings suggest that promotion of social capital may be useful in enhancing language/literacy outcomes for adolescents who are DHH, or vice versa. Interventions for this group typically only focus on improving language/literacy, however, school/agencies could also look at how their educational programs improve social capital, or include teaching material to expand youth social-capital-related language (e.g. communication to access resources). These results also indicate that self-report measures may be more useful than parent-report when looking at relationships with outcomes. Nevertheless, future studies with larger samples of adolescents and parents is needed to confirm this.

Social Capital and Adolescent Psychosocial Outcomes

Neither parent- or adolescent-reported social capital were found to be significantly correlated with any of the psychosocial measures used in the current study. This included parent-rated social competence with peers, as well as adolescent self-report of loneliness and social satisfaction. This finding is in contrast to the majority of previous literature showing a positive relationship between social capital and various indicators of psychological well-being (McPherson et al., 2014; Steinfield et al., 2008; Yamaguchi, 2013). However, again there was low variability within this small sample; and although not significant, the majority of correlations were in the expected direction where higher social capital was related to higher social competence and social satisfaction.

In a systematic review of the literature, McPherson and colleagues (2014) reviewed 55 studies looking at the impact of family and community social capital on mental health and behavioral problems in children and adolescents. The areas of social capital that McPherson et al. found were most related to mental health outcomes included parent-child relationships, social support networks and quality of the neighborhood. The most similar measures used in the current study were LSCS sense of belonging and FES family which did have the highest correlations with psychosocial measures. However, the measures of social capital included in McPherson et al., (2014) were very broad, and the individual-level measures such as family structure and support networks have been criticized as measuring social support rather than social capital. This highlights the difficulty of measuring social capital, and how the actual relationships/networks are often confused with the positive outcomes derived from those relationships. Of the studies that used community-level measures such as civic engagement and community trust/safety, the authors found little relationship with mental health and behavior problems. Therefore, it is likely that only certain aspects of social capital (e.g., bonding, family/peer support etc.) are related to psychosocial outcomes; however, replication in a larger sample is necessary to determine if this is also the case in adolescents who are DHH.

Promoting Social Capital in Adolescents who are DHH

Overall, the current findings lend some support to promoting social capital in adolescents who are DHH and their families. The areas of social capital that were rated lower overall were bridging- or linking-related domains, such as working with other families like their own, and feeling a sense of power/control over community and political-level decisions regarding the child. Wilkens and Hehir (2008) suggest that bridging social capital can be

promoted through stronger ties between schools with specific programs for students who are DHH, access to working adults who are DHH to provide role models, bringing together parents, supporting children's participation in all types of activities, and strengthening ties between schools and college/universities to prepare students who are DHH for transitions. Although the sample size in this study was very small, the results also suggest that adolescents with hearing loss and additional disabilities may be more at risk of low social capital. In addition, parents' social capital decreased with adolescents' age, which may be related to the transition from elementary to high school.

The majority of social capital studies have used a cross-sectional design and very few have attempted to improve social capital (Onyx & Leonard, 2010). Although not specifically targeting social capital, some studies that have attempted to improve empowerment and self-efficacy for families of children with disabilities, e.g., through parent-training programs (Bickman, Heflinger, Northrup, Sonnichsen, & Schilling, 1998; Melnyk et al., 2004; Olin et al., 2010). These types of educational interventions have focused on improving parents' knowledge and understanding of the particular issues of the child, increasing parents' participation in their child's care (Melnyk et al., 2004); knowledge of the service system and skills to interact with the system (Bickman et al., 1998); and facilitating linkage of parents to agencies, services and other families with similar issues (Olin et al., 2010).

In regards to what service-providers can do, other studies have looked at how family-centered delivery of services can improve family empowerment (Nachshen, 2005; Thompson et al., 1997). Thompson et al. (2007) found a disabilities program 'Early On' that used a family-centered approach led to greater parental empowerment. The program worked with families as partners in developing a coherent service plan based on family's needs, provided a service coordinator to each family to advocate at their request, and included training for parents in advocacy skills related to service system issues and working with service providers as partners. Structural equation modelling showed an indirect pathway between the program and empowerment through increased support and lower stress. The findings emphasize that empowerment is a learned behavior. A clear family-centered service plan and helping families to develop skills to cope with the complexities of the service system, can act as a platform for family members to advocate on their own behalf. Service providers can assist families in identifying and engaging lateral supports from friends, family and community organizations to effectively substitute for services that are often limited (Thompson et al., 1997).

Finally, as shown in an adult literacy and numeracy program (Balatti et al., 2006), educational interventions can also lead to improved social capital. Balatti and colleagues found that in some cases, it was the social capital outcomes, and not the improved literacy or numeracy skills that made more impact on their participants' quality of life. They gave the example of one young man who made no improvements on literacy skills, but as a result of the course had established new networks and positively changes the way he interacted with adults, which in turn led him to approach prospective employers and secure a job. The authors suggested that there are specific teaching/learning practices more conducive to generating social capital in students, including the creations of supportive networks between fellow students, with teachers and other staff. Placing the student at the center of these

networks can facilitate students to redefine their connection with educational institutions and people in authority, as well as their identity as a learner and a member of society.

Limitations and Recommendations

The main limitation of this preliminary study is the small sample size, comprising adolescents who primarily communicate using spoken English. Consequently, statistical analyses were limited to descriptive and non-parametric correlational analyses. Nevertheless, the response rate (25%) was similar to that of other online survey studies (Shih & Fan, 2008). Future studies need to be carried out in larger and more diverse samples of adolescents and their parents (e.g., those from diverse SES/family backgrounds). This study also adapted the LSCS and FES that were originally developed as parent-report scales, for use in adolescents. Future studies could validate these adapted adolescent-report scales in a larger sample. In addition, the written questionnaire could be adapted into ASL for administration to adolescents who use ASL for exploring their social capital. Such studies will increase understanding about the direction of relationships between communication abilities, language, and social capital, so that findings can be generalized to the wider population of DHH adolescents.

Finally, the language/literacy outcome measures were collected retrospectively from sharing data with the LOCHI study. The direct assessments were completed when the child was 9 years old and so collected between 2–5 years prior to the social capital data collected in the current study. Some of the children may have improved (or declined) in regards to their current language/literacy abilities. However, we previously found in a pilot study (Wong, Ching, Whitfield et al., 2016) that asking for adolescents to self-report their NAPLAN results was unreliable to measure literacy skills. Additionally, although previous longitudinal research on language and reading outcomes in children who are DHH showed that raw scores on the CELF and Woodcock Reading Mastery Test increased between ages 9 to 12, this did not correspond with an increase in standard scores over time (Dunn et al., 2014).

Conclusion

Very little research has focused on the social capital of adolescents who are DHH, or its relationship with language, literacy and psychosocial outcomes. Although these results are only preliminary, they suggest a positive relationship between parent and adolescents' social capital; that parents of older adolescents and those with additional disabilities are at risk of lower social capital, and that aspects of adolescent-reported social capital are positively related to their language and literacy outcomes. Although we were not able to show a significant relationship between social capital and psychosocial outcomes, the aspects of social capital shown to be linked to psychosocial outcomes in previous studies were correlated in the expected direction. The study gives support and consideration for the promotion of social capital in adolescents who are DHH and their families. Interventions that support and empower adolescent and their parents to build rich networks with teachers, professionals, peers and other families, may be beneficial to improve social capital and other developmental outcomes. However, further investigation of these relationships in a larger sample of adolescents and their parents will be key in developing appropriate and timely

interventions to improve access to social resources and outcomes into older adolescence and ultimately adulthood.

Acknowledgments

This research was funded in part by the Department of Education and Training Victoria. The LOCHI study was partly supported by the National Institute on Deafness and Other Communication Disorders (Award Number R01DC008080). The authors acknowledge the financial support of the HEARing CRC, established and supported under the Cooperative Research Centres Program – an Australian Government initiative. The authors also acknowledge support from the Australian Department of Health, the WA Foundation for Deaf Children, and the Deafness Foundation of Victoria. We gratefully thank all the children and their families from the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study for participation in this research.

References

- Ahn J. The effect of social network sites on adolescents' social and academic development: Current theories and controversies. *Journal of the American Society for Information Science and Technology*. 2011; 62(8):1435–1445.
- Akey TM, Marquis JG, Ross ME. Validation of scores on the Psychological Empowerment Scale: A measure of empowerment for parents of children with a disability. *Educational and Psychological Measurement*. 2000; 60(3):419–438.
- Allan J, Smyth G, l'Anson J, Mott J. Understanding disability with children's social capital. *Journal of Research in Special Educational Needs*. 2009; 9(2):115–121.
- Balatti, J., Black, S., Falk, I. Reframing adult literacy and numeracy: A social capital perspective. Paper presented at the 9th Australian Vocational Education and Training Research Association Conference; 19–21 April; Wollongong, NSW, Australia. 2006.
- Barak A, Sadosky Y. Internet use and personal empowerment of hearing-impaired adolescents. *Computers in Human Behavior*. 2008; 24(5):1802–1815.
- Batten G, Oakes PM, Alexander T. Factors associated with social interactions between deaf children and their hearing peers: A systematic literature review. *Journal of deaf studies and deaf education*. 2014; 19(3):285–302. [PubMed: 24222193]
- Bickman L, Heflinger CA, Northrup D, Sonnichsen S, Schilling S. Long term outcomes to family caregiver empowerment. *Journal of Child and Family Studies*. 1998; 7(3):269–282.
- Bourdieu, P. The forms of capital (1986). West Sussex, UK: Wiley Blackwell; 2011.
- Cassidy J, Asher SR. Loneliness and peer relations in young children. *Child Development*. 1992; 63(2):350–365. [PubMed: 1611939]
- Cawthon SW, Caemmerer JM, Dickson DM, Ocuto OL, Ge J, Bond MP. Social skills as a predictor of postsecondary outcomes for individuals who are deaf. *Applied Developmental Science*. 2015; 19(1):19–30.
- Chenoweth L, Stehlik D. Implications of social capital for the inclusion of people with disabilities and families in community life. *International Journal of Inclusive Education*. 2004; 8(1):59–72.
- Ching TY, Crowe K, Martin V, Day J, Mahler N, Youn S, Orsini J. Language development and everyday functioning of children with hearing loss assessed at 3 years of age. *International Journal of Speech-Language Pathology*. 2010; 12(2):124–131. [PubMed: 20420353]
- Ching TY, Dillon H, Marnane V, Hou S, Day J, Seeto M, Van Buynder P. Outcomes of early-and late-identified children at 3 years of age: findings from a prospective population-based study. *Ear and Hearing*. 2013; 34(5):535–552. [PubMed: 23462376]
- Ching TY, Leigh G, Dillon H. Introduction to the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study: Background, design, sample characteristics. *International Journal of Audiology*. 2013; 52(S2):S4–S9. [PubMed: 24350694]
- Cupples L, Ching TY, Button L, Seeto M, Zhang V, Whitfield J, Marnane V. Spoken language and everyday functioning in 5-year-old children using hearing aids or cochlear implants. *International Journal of Audiology*. under review.

- Coleman JS. Social capital in the creation of human capital. *American journal of sociology*. 1988; 94:S95–S120.
- Crosnoe R. Social capital and the interplay of families and schools. *Journal of Marriage and Family*. 2004; 66(2):267–280.
- Dammeyer J. 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*. 2010; 15(1):50–58. [PubMed: 19745003]
- Dika SL, Singh K. Applications of social capital in educational literature: A critical synthesis. *Review of educational research*. 2002; 72(1):31–60.
- Drukker M, Kaplan C, Feron F, Van Os J. Children's health-related quality of life, neighbourhood socio-economic deprivation and social capital. A contextual analysis. *Social Science and Medicine*. 2003; 57(5):825–841. [PubMed: 12850109]
- Dunn CC, Walker EA, Oleson J, Kenworthy M, Van Voorst T, Tomblin JB, Hanson M. Longitudinal speech perception and language performance in pediatric cochlear implant users: the effect of age at implantation. *Ear and Hearing*. 2014; 35(2):148. [PubMed: 24231628]
- Emerson E, Hatton C. Poverty, socio-economic position, social capital and the health of children and adolescents with intellectual disabilities in Britain: a replication. *Journal of Intellectual Disability Research*. 2007; 51(11):866–874. [PubMed: 17910538]
- Grootaert, C., Narayan, D., Nyham Jone, V., Woolcock, M. *Measuring social capital: An integrated questionnaire*. Washington D.C: World Bank Publications; 2004.
- Hintermair M. Hearing impairment, social networks, and coping: The need for families with hearing-impaired children to relate to other parents and to hearing-impaired adults. *American Annals of the Deaf*. 2000; 145(1):41–53. [PubMed: 10812689]
- Hoffman MF, Quittner AL, Cejas I. Comparisons of social competence in young children with and without hearing loss: A dynamic systems framework. *Journal of deaf studies and deaf education*. 2015; 20(2):115–124. [PubMed: 25583707]
- Israel GD, Beaulieu LJ, Hartless G. The Influence of Family and Community Social Capital on Educational Achievement. *Rural sociology*. 2001; 66(1):43–68.
- Kawachi I, Berkman LF. Social ties and mental health. *Journal of Urban Health*. 2001; 78(3):458–467. [PubMed: 11564849]
- Kent BA. Identity issues for hard-of-hearing adolescents aged 11, 13, and 15 in mainstream setting. *Journal of Deaf Studies and Deaf Education*. 2003; 8(3):315–324. [PubMed: 15448055]
- Knors H, Vervloed MP. Educational programming for deaf children with multiple disabilities: Accommodating special needs. *Oxford handbook of deaf studies, language, and education*. 2003:82–94.
- Koren PE, DeChillo N, Friesen BJ. Measuring empowerment in families whose children have emotional disabilities: a brief questionnaire. *Rehabilitation Psychology*. 1992; 37(4):305.
- Leigh G, Ching TY, Crowe K, Cupples L, Marnane V, Seeto M. Factors affecting psychosocial and motor development in 3-year-old children who are deaf or hard of hearing. *Journal of deaf studies and deaf education*. 2015; 20(4):331–342. [PubMed: 26209447]
- Lochner K, Kawachi I, Kennedy BP. Social capital: a guide to its measurement. *Health & place*. 1999; 5(4):259–270. [PubMed: 10984580]
- Looman WS. Development and testing of the social capital scale for families of children with special health care needs. *Research in Nursing and Health*. 2006; 29(4):325–336. [PubMed: 16847911]
- Looman WS, Farrag S. Psychometric properties and cross-cultural equivalence of the Arabic Social Capital Scale: instrument development study. *International Journal of Nursing Studies*. 2009; 46(1):45–54.
- Luckner, JL. Promoting resilience: Suggestions for families, professionals, and students. In: Zand, DH., Pierce, KJ., editors. *Resilience in deaf children: Adaption through emerging adulthood*. New York, NY: Springer; 2011. p. 207–228.
- McPherson KE, Kerr S, McGee E, Morgan A, Cheater FM, McLean J, Egan J. The association between social capital and mental health and behavioural problems in children and adolescents: an integrative systematic review. *BMC psychology*. 2014; 2(1):1.

- Melnik BM, Alpert-Gillis L, Feinstein NF, Crean HF, Johnson J, Fairbanks E, Corbo-Richert B. Creating opportunities for parent empowerment: program effects on the mental health/coping outcomes of critically ill young children and their mothers. *Pediatrics*. 2004; 113(6):e597–e607. [PubMed: 15173543]
- Morrow V. Conceptualising social capital in relation to the well-being of children and young people: a critical review. *The sociological review*. 1999; 47(4):744–765.
- Nachshen J. Empowerment and families: Building bridges between parents and professionals, theory and research. *Journal on Developmental Disabilities*. 2005; 11(1):67–76.
- Narayan D, Cassidy MF. A dimensional approach to measuring social capital: development and validation of a social capital inventory. *Current sociology*. 2001; 49(2):59–102.
- Olin SS, Hoagwood KE, Rodriguez J, Ramos B, Burton G, Penn M, Jensen PS. The application of behavior change theory to family-based services: Improving parent empowerment in children's mental health. *Journal of Child and Family Studies*. 2010; 19(4):462–470. [PubMed: 20676353]
- Onyx J, Bullen P. Measuring social capital in five communities. *The journal of applied behavioral science*. 2000; 36(1):23–42.
- Onyx J, Leonard R. The conversion of social capital into community development: An intervention in Australia's outback. *International journal of urban and regional research*. 2010; 34(2):381–397. [PubMed: 20726148]
- Paiva PCP, de Paiva HN, de Oliveira Filho PM, Lamounier JA, e Ferreira EF, Ferreira RC, Zarzar PM. Development and validation of a social capital questionnaire for adolescent students (SCQ-AS). *PloS One*. 2014; 9(8):e103785. [PubMed: 25093409]
- Paldam M. Social capital: one or many? Definition and measurement. *Journal of economic surveys*. 2000; 14(5):629–653.
- Parcel TL, Menaghan EG. Early parental work, family social capital, and early childhood outcomes. *American journal of sociology*. 1994:972–1009.
- Pearce N, Davey Smith G. Is social capital the key to inequalities in health? *American Journal of Public Health*. 2003; 93(1):122–129. [PubMed: 12511401]
- Putnam, R. *Bowling alone, the collapse and revival of civic America*. New York, NY: Simon and Schuster Paperbacks; 2000.
- Resendez MG, Quist RM, Matshazi DG. A longitudinal analysis of family empowerment and client outcomes. *Journal of Child and Family Studies*. 2000; 9(4):449–460.
- Rothon C, Goodwin L, Stansfeld S. Family social support, community "social capital" and adolescents' mental health and educational outcomes: a longitudinal study in England. *Social Psychiatry and Psychiatric Epidemiology*. 2012; 47(5):697–709. [PubMed: 21557090]
- Sampson RJ, Morenoff JD, Earls F. Beyond social capital: Spatial dynamics of collective efficacy for children. *American Sociological Review*. 1999:633–660.
- Shih TH, Fan X. Comparing response rates from web and mail surveys: A meta-analysis. *Field methods*. 2008; 20(3):249–271.
- Singh NN, Curtis WJ, Ellis CR, Nicholson MW, Villani TM, Wechsler HA. Psychometric analysis of the family empowerment scale. *Journal of Emotional and Behavioral Disorders*. 1995; 3(2):85–91.
- Spence, SH. *Social skills training: Enhancing social competence with children and adolescents*. Nfer-Nelson; 1995.
- Stafford M, De Silva M, Stansfeld S, Marmot M. Neighbourhood social capital and common mental disorder: testing the link in a general population sample. *Health & place*. 2008; 14(3):394–405. [PubMed: 17919964]
- Stanton-Salazar RD. A social capital framework for the study of institutional agents and their role in the empowerment of low-status students and youth. *Youth & Society*. 2011; 43(3):1066–1109.
- Stanton-Salazar RD, Dornbusch SM. Social capital and the reproduction of inequality: Information networks among Mexican-origin high school students. *Sociology of education*. 1995:116–135.
- Steinfeld C, Ellison NB, Lampe C. Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology*. 2008; 29(6):434–445.

- Stevenson J, McCann D, Watkin P, Worsfold S, Kennedy C. The relationship between language development and behaviour problems in children with hearing loss. *Journal of Child Psychology and Psychiatry*. 2010; 51(1):77–83. [PubMed: 19686333]
- Thompson L, Lobb C, Elling R, Herman S, Jurkiewicz T, Hulleza C. Pathways to family empowerment: Effects of family-centered delivery of early intervention services. *Exceptional Children*. 1997; 64(1):99–113.
- Wilkens CP, Hehir TP. Deaf education and bridging social capital: A theoretical approach. *American Annals of the Deaf*. 2008; 153(3):275–284. [PubMed: 18807401]
- Williams D. On and off the Net: Scales for social capital in an online era. *Journal of Computer-Mediated Communication*. 2006; 11(2):593–628.
- Wolters N, Knoors H, Cillessen AHN, Verhoeven L. Impact of peer and teacher relations on deaf early adolescents' well-being: Comparisons before and after major school transition. *Journal of Deaf Studies and Deaf Education*. 2012; 17:463–482. DOI: 10.1093/deafed/ens1021 [PubMed: 22988295]
- Wong CL, Ching TY, Leigh G, Cupples L, Button L, Marnane V, Martin L. Psychosocial Development of 5-year-old Children with Hearing Loss: Risks and protective factors. *International Journal of Audiology*. 2016
- Wong CL, Ching TY, Whitfield J, Duncan J. Online Social Participation, Social Capital and Literacy of Adolescents with Hearing Loss: A Pilot Study. *Deafness & Education International*. 2016; 18(2): 103–116.
- Yamaguchi A. Impact of social capital on the psychological well-being of adolescents. *International Journal of Psychological Studies*. 2013; 5(2):100–109.
- Yoshinaga-Itano C, Sedey AL, Coulter DK, Mehl AL. Language of early- and later-identified children with hearing loss. *Pediatrics*. 1998; 102(5):1161–1171. [PubMed: 9794949]
- Zeedyk MS, Gallacher J, Henderson M, Hope G, Husband B, Lindsay K. Negotiating the transition from primary to secondary school: perceptions of pupils, parents and teachers. *School Psychology International*. 2003; 24(1):67–79.
- Ziersch AM. Health implications of access to social capital: findings from an Australian study. *Social Science and Medicine*. 2005; 61(10):2119–2131. [PubMed: 16115715]

Table 1**Adolescent and Parent Characteristics and Demographics**

		Respondent	
		Adolescent	Parent
Gender	M; F	8 (50%); 8 (50%)	1; 23
Age of adolescent	Range	11–14 years	
	Mean	12.25 years	
Adolescent's device	1 HA	1 (6.3%)	
	2 HAs	9 (56.3%)	
	1 CI	2 (12.5%)	
	2 CIs	4 (25%)	
	CI+HA	0	
Adolescent's severity of hearing loss	Mild (20–40 dB HL)	3 (18.75%)	
	Moderate (41–60 dB HL)	6 (8.5%)	
	Severe (61–80 dB HL)	2 (12.5%)	
	Profound (>80 dB HL)	5 (31.25%)	
Adolescent's communication mode	Spoken English only	14 (87%)	
	Combined comm	2 (13%)	
Adolescent's presence of additional disabilities	No	12 (75%)	
	Yes	4 (25%)	
Maternal education	High school	2 (12.5%)	
	Diploma/certificate	4 (25%)	
	University	10 (62.5%)	
Education level	High school		3 (12.5%)
	Diploma/certificate		8 (33.3%)
	University		13 (54.2%)
IRSAD Decile	Median	9	9
	Range	1–10	1–10
Adolescent's cognitive ability (WNV)	Mean (SD)	107 (13.5)	
	Range	80–134	
Adolescent's language ability (CELF-4 Core)	Mean (SD)	86.57 (18.76)	
	Range	45–122	
Adolescent's reading ability (WDRB)	Mean (SD)	102.29 (14.73)	
	Range	64–129	

Note: HA=hearing aid, CI=cochlear implant; Combined comm = Speech and sign; IRSAD= Index of Relative Socio-economic Advantage and Disadvantage

Table 2

Social Capital- Looman Social Capital Scale (LSCS) and Family Empowerment Scale (FES)

	Domain [score range]	Parent version (n=24) M (SD)	Adolescent version (n=16) M (SD)
LSCS	Sense of Belonging [1–5]	3.79 (.67)	4.17 (.44)
	Common Good [1–5]	2.54 (.88)	2.44 (1.2)
	School Connection [1–5]	4.04 (.76)	4.12 (.88)
	Information/Asking [1–5]	3.58 (.48)	3.87 (.69)
	Total [1–20]	13.96 (1.8)	14.60 (2.34)
FES	Family [1–5]	4.14 (.456)	3.90 (.524)
	Service [1–5]	4.06 (.463)	3.36 (.681)
	Community/Political	2.61 (.644)	N/A
	Total [Parent: 1–15; Adolescent 1–10]	10.81 (1.09)	7.32 (1.07)

Table 3

Correlations of social capital measures between adolescent and parent dyads.

Child Parent	LSCS belonging	LSCS common good	LSCS school	LSCS info/asking	LSCS total	FES family	FES services	FES total
LSCS belonging	.605*	.110	.274	.024	.523	.511	.186	.175
LSCS common good	-.288	.037	-.662**	.091	-.362	-.508	-.355	-.633*
LSCS school	.166	-.058	.133	.621*	.124	.194	-.286	-.026
LSCS info/asking	-.289	-.016	-.426	-.014	-.306	-.176	.099	-.096
LSCS total	.275	.268	-.156	.530	.222	.107	-.066	-.230
FES family	.534	-.348	-.076	-.381	.077	.442	.512	.633*
FES services	.637*	-.039	.135	-.235	.381	.601*	.665*	.707*
FES total	.470	-.208	-.175	-.217	.049	.404	.595*	.601*

* p<.05,

** p<.001

Table 4
Spearman Rho correlations between Parent- and Adolescent-report social capital and child/family characteristics

PARENT	Disabilities N:Y	Gender M:F	Age	4FA	WNV	HA:CI	Mat Ed	SES
LSCS belonging	-.392	-.178	-.191	-.046	.133	.051	-.261	-.158
LSCS common good	.103	-.360	-.196	-.072	-.263	-.073	.015	-.152
LSCS school	-.280	.037	-.360	.048	.195	.165	-.115	-.083
LSCS info/asking	-.078	0	-.262	-.174	.137	-.156	-.109	-.196
LSCS total	-.381	-.218	-.441*	-.056	.108	.038	-.282	-.297
FES family	-.255	.158	-.136	-.050	.382	-.117	.268	.135
FES services	-.327	-.118	-.144	.152	.212	.283	.097	.166
FES community	-.080	-.331	-.117	-.162	-.074	-.076	.311	.316
FES total	-.207	-.210	-.158	-.046	.212	.028	.322	.372
ADOLESCENT	Disabilities N:Y	Gender M:F	Age	4FA	WNV	HA:CI	Mat Ed	SES
LSCS belonging	-.474	-.042	-.195	-.356	.207	-.219	-.141	-.117
LSCS common good	-.359	.042	-.444	-.251	.085	-.146	-.002	-.402
LSCS school	-.316	-.058	-.007	-.036	.052	.015	.198	-.057
LSCS info/asking	-.197	.028	-.424	-.330	.038	-.118	-.136	-.440
LSCS total	-.597*	-.140	-.326	-.372	.216	-.332	.086	-.322
FES family	-.495	.110	-.180	-.418	.349	-.133	.029	-.057
FES services	-.368	.202	.101	-.167	-.023	.263	.012	-.028
FES total	-.303	.337	.175	-.208	.219	.255	.142	.201

* p<.05,

** p<.001

Table 5

Spearman Rho correlations between Parent- and Adolescent-reported social capital and child language/literacy outcomes

PARENT	CELF-Core	CELF Receptive	CELF Expressive	CELF Language Memory	WDRB reading	Social comp	LLSQ
LSCS belonging	-.081	-.273	.058	.009	.419	.323	.192
LSCS common good	.032	.053	-.071	.024	-.215	.183	.045
LSCS school	-.285	-.296	-.217	-.198	-.046	.102	-.248
LSCS info/asking	.010	.117	-.048	-.025	.175	.005	-.211
LSCS total	-.158	-.240	-.098	-.093	.179	.278	.081
FES family	.304	.238	.276	.366	.314	.344	.123
FES services	.191	.090	.343	.325	.322	.030	.000
FES community	-.196	-.127	-.177	-.139	-.270	.164	.145
FES Total	.079	.066	.161	.210	.132	.259	.232
ADOLESCENT	CELF-Core	CELF Receptive	CELF Expressive	CELF Language Memory	WDRB reading	Social comp	LLSQ
LSCS belonging	.256	-.124	.388	.284	.499	.375	.356
LSCS common good	.214	-.063	.358	.185	.341	-.206	-.317
LSCS school	.155	.215	.167	.182	.502	.237	.329
LSCS info/asking	.064	-.087	.055	.116	.157	-.086	.079
LSCS total	.273	.024	.340	.294	.684**	.269	.242
FES family	.555*	.359	.628*	.580*	.751**	.278	.328
FES services	.563*	.435	.688**	.545	.048	.276	.146
FES total	.585*	.536	.684*	.599*	.240	.232	.207

Note: CELF= Clinical Evaluation of Language Fundamentals 4th Edition; WDRB= Woodcock-Johnson III Diagnostic Reading Battery;

* p<.05,

** p<.001