

Mode of Communication, Perceived Level of Understanding, and Perceived Quality of Life in Youth Who Are Deaf or Hard of Hearing

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Given the important role of parent–youth communication in adolescent well-being and quality of life, we sought to examine the relationship between specific communication variables and youth perceived quality of life in general and as a deaf or hard-of-hearing (DHH) individual. A convenience sample of 230 youth (mean age = 14.1, standard deviation = 2.2; 24% used sign only, 40% speech only, and 36% sign + speech) was surveyed on communication-related issues, generic and DHH-specific quality of life, and depression symptoms. Higher youth perception of their ability to understand parents' communication was significantly correlated with perceived quality of life as well as lower reported depressive symptoms and lower perceived stigma. Youth who use speech as their single mode of communication were more likely to report greater stigma associated with being DHH than youth who used both speech and sign. These findings demonstrate the importance of youths' perceptions of communication with their parents on generic and DHH-specific youth quality of life.

For youth with hearing loss, there is consensus by both clinicians and researchers that having access to communication at home, school, and with peers is important for language as well as cognitive and socio-emotional development (Kushalnagar et al., 2010; Marschark, 2007; Steinberg, Brainsky, Bain, & Montoya, 1999; Vaccari & Marschark, 1997). Meadow-Orlans, Spencer, and Koester (2004)

reported that deaf children who share the same language as their parents, as in an all-deaf family, demonstrated comparable social and emotional development as hearing children. However, these families are in the minority. More than 96% of deaf children are born to hearing parents, with little or no prior knowledge or experience with providing an accessible communication environment to the child who has a hearing loss (Mitchell & Karchmer, 2004; Vaccari & Marschark, 1997). Although common language between deaf and hard-of-hearing (DHH) youth and parents can help facilitate communication, it is the successful exchange of ideas and information between parent and child that is critical for overall development in youth who are DHH (Calderon & Greenberg, 2003; Mayberry, 2010; Moeller & Schick, 2006; Schick, de Villiers, de Villiers, & Hoffmeister, 2007). When communication at home is not accessible, the youth experiences a social barrier and has difficulty participating in conversations with their parents. This barrier in the youth's home environment can result in adverse impacts on the youth's overall socioemotional well-being as well as parental participation in the youth's academic success.

It is not the modality of the language (i.e., signed, spoken, or mixed), but rather, the communicative competence in the language shared by both parent and child that promoted the child's socioemotional development (Hintermair, 2006). This conclusion

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was drawn based on parental psychosocial adjustment and child socioemotional functioning data from 213 sets of parents and their DHH children (ages 4.0–12.9 years). Although Hintermair's study used parents' evaluations of children's communicative competence and not the youth's perception of own competency in understanding parent–youth dialogues, the findings lend some support that communication competency rather than communication modality underlies the ability to exchange ideas and information and allows children to internalize thoughts, contemplate other people's thinking, and use inner language to moderate social behaviors as they engage in dialogues with their parents. **Indeed, in a study of 57 deaf adolescents with and without cochlear implants (CIs) using both a generic instrument and a Deaf Acculturation Scale, it was found that perceived satisfaction with communication at home was significantly correlated with higher self-esteem in social competence and high scholastic self-esteem as well as higher overall life satisfaction (Leigh, Maxwell-McCaw, Bat-Chava, & Christiansen, 2009).** In this study, the majority of the youth participants had hearing parents and satisfaction with communication at home. Home satisfaction was associated with youth's perceived identification with the hearing community. The researchers attributed this to the ease of communication that developed at home during the early years and suggested that this promoted higher social competence and increased self-esteem outside of the home.

Gilman, Easterbrooks, and Frey (2004) used the Multidimensional Students' Life Satisfaction Scale to compare DHH youth, ages 8–18 years, to their hearing peers and found significant group differences with **DHH youth reporting significantly lower scores on overall satisfaction with life, friendships, and family and living environment. Frustration with communication was cited as a possible explanation for these group differences.** In a comparative study of **German** DHH and hearing children (ages 6–16 years), self-rated reports and interviews using an inventory of life quality revealed group differences **(Fellinger, Holzinger, Sattel, & Laucht, 2008).** Youth with hearing loss reported greater satisfaction with school and family, but lower satisfaction with quality of life, in general, and fewer recreational activities and interests than

children with normal hearing ability. Within the hearing loss group, however, children with varying degrees of hearing loss did not differ in their self-rating scores on the quality of life measure, except in one domain in which **children with CIs were significantly less satisfied with their school quality of life.**

Reduced communication, especially with parents who struggle to communicate in the DHH youth's language, has the potential of negatively impacting the youth's quality of life and emotional well-being. The impact becomes greater when the youth perceives basic understanding of parent–youth communication to be difficult, even if the actual rating of the communication quality is higher than the youth's perception. By understanding the relationship between how DHH youth perceived communication at home and their quality of life, psychologists, healthcare providers, and school personnel will be able to work more effectively with youth to improve and maintain a positive quality of life.

Specific Aims

Given the important role of parent–youth communication in adolescent well-being and quality of life, we sought to assess the relationship between specific communication variables and youth perceived quality of life in general and as a DHH individual. A multivariate modeling framework was used to address the following specific aims:

1. Specific Aim 1: Compare youth generic and DHH-specific quality of life across their preferred modes of communication.
2. Specific Aim 2: Compare youth perceived generic and DHH-specific quality of life across the youth's perception of their understanding of parents' communication.

Methods

Participant Procedure

Approval for all aspects of this research was received from the Institutional Review Boards of Seattle Children's Hospital, Seattle, WA, and the University of Colorado, Boulder. In order to assure that different

subgroups were included, stratified sampling of hearing level and school type was conducted. Youth participants between 11 to 18 years old in Washington, Colorado, Texas, Arizona, and other states were recruited by disseminating flyers through schools, audiology listserves, parent and DHH community listserves, and social community network Web sites.

Telephone and videophone screening calls with a primary caregiver assessed youth eligibility for participation in the study. Eligibility included having a hearing loss of more than 26 dB in the better ear and the ability to read English at least at the Grade 4 level. Youth were excluded if their primary caregiver indicated that they had a comorbid mental or physical condition that currently had a greater impact on their life than their hearing loss. For example, if a parent reported that the youth's cerebral palsy had a greater impact on his or her quality of life than hearing loss at the time of survey participation, then this youth was excluded.

Audiologic records were requested for all participants. An audiologist certified by the American Speech, Language, and Hearing Association reviewed all received audiograms. Based on Clark, Tong, Martin, and Busby (1981), degree of hearing loss guidelines, we classified participants' degree of hearing loss based on the better ear pure tone average (PTA) or the average unaided air conduction thresholds at 500, 1,000, and 2,000 Hz. Degree of hearing loss was categorized as "mild" (PTA = 26–40 dB), "moderate" (PTA = 41–55 dB), "moderate-severe" (PTA = 56–70 dB), "severe" (PTA = 71–90 dB), or "profound" (PTA > 90 dB). Participants using a CI were characterized as "cochlear implant". Children or youth who had a PTA \leq 26 dB but who had significant hearing loss in the higher frequencies only were entered as "mild."

Informed written consent from parent and assent from youth were obtained prior to participation in the study. Eligible participants completed a reading screener to determine appropriateness of the different modes of questionnaire administration: English paper-and-pencil, Web based, or DVD administration in American Sign Language (ASL) or Pidgin Signed English (PSE). Participants who scored below the required cutoff for paper-pencil and Web mode (at

least four correct responses out of eight items on reading screener) were given a choice of completing the DVD questionnaire in ASL or PSE, both of which included signed video clips and English text for each question on the screen. Time to complete paper-pencil/Web was approximately 45 min. DVD administration took approximately 1 hr to complete. Following completion, participants were given a \$25 gratuity for their participation time and effort.

Instruments

All instruments are self-administered and available in both English print and DVD in ASL or PSE versions. Permission to adapt existing instruments to ASL and PSE was obtained from the test publishers. Many of the Colorado Individual Performance Profile (CIPP) items are teacher report and were reworded to be completed by the youth themselves. Materials were translated by two bilingual signers on the research team, and two fluent DHH youth signers served as sign models for the DVDs. Cognitive debriefing with DHH youth was used to validate survey items.

Youth Quality of Life-Revised. The Youth Quality of Life—Revised (YQoL-R) is a 41-item previously validated generic quality of life measurement designed for all youth ages 11–18 years (Edwards, Huebner, Connell, and Patrick, 2002; Patrick, Edwards, & Topolski, 2002). It is a self-administered questionnaire readable at the fourth-grade level, which assesses QoL in four domains: sense of self, social relationships, environment, and general quality of life. Psychometric analyses of the YQoL-R perceptual scales have yielded scores with acceptable internal consistency (Cronbach's alpha = .77–.96), reproducibility (intraclass correlation coefficients [ICCs] = 0.74–0.85), expected associations with other measured concepts, and ability to distinguish among known groups. It takes approximately 15 min to complete.

Youth Quality of Life—Deaf and Hard-of-Hearing module. The Youth Quality of Life—Deaf and Hard-of-Hearing (YQoL-DHH) is a validated quality of life instrument specific to youth ages 11–19 years who are DHH (Patrick et al., 2011). A readability

analysis has confirmed that this instrument is readable at the fourth-grade level using the Homan–Hewitt formula, which takes into account number of words per thought unit, number of words unfamiliar (below 75% fourth-grade level of Living Word Vocabulary), and number of words with seven letters or more (Homan, Hewitt, & Linder, 1994). The instrument assesses youth QoL as a DHH person in three domains: participation, self-acceptance and advocacy, and perceived stigma. Psychometric analyses of the YQoL–DHH perceptual scales have yielded scores with acceptable internal consistency (Cronbach’s $\alpha = .84-.87$), reproducibility (ICCs = 0.79–0.88), and expected associations with other measured concepts. It takes approximately 15 min to complete the paper version and 30 min to complete the DVD version.

Children’s Depression Inventory—Short Form. The Children’s Depression Inventory—Short Form (CDI-S; Kovacs, 1992) has 10 items that assess the presence of depressive symptomatology over the past 2 weeks, with higher scores indicating increased symptom severity. The CDI-S is highly correlated with the longer 27-item CDI ($r = .89$), which has good internal consistency ($r = .71-.88$). Depressive symptoms as measured by the CDI are significantly correlated with quality of life among youth with and without disabilities (Patrick, Edwards, & Topolski, 2002).

Colorado Individual Performance Profile: Classroom Participation Questionnaire. The CIPP is a multipurpose tool with items related to hearing loss and age at diagnosis, history of amplification use, type of school placement, family information, and language modality usage (Colorado Department of Education, 2002). The CIPP consists of two parts—Student Demographic Information and Student Assessment. Only the classroom participation questionnaire was drawn from the student assessment part, adapted for ease of self-administration and used in the current study.

Communication Variables

Youth preferred mode of communication. Youth indicated their preferred mode of communication; choices

included sign, speech, and sign plus speech as possible choices for the youth’s mode of communication at home, with friends, and at school. In addition, parents were asked about the youth’s mode of communication as part of the initial parent screen to determine eligibility for the study. Youth report and parent report were cross-referenced for questions related to mode of communication used in the home, school, and with friends. Consistent mode of communication across setting was automatically assigned as the selected mode of communication. If the mode of communication was the same for two settings (e.g., speech for home and speech for school, but speech and sign for friends), then “speech” was assigned as the youth’s overall mode of communication. If each mode of communication was different (e.g., speech for home, speech and sign for school, and sign for friends), then “speech and sign” was assigned as the youth’s overall mode of communication (MoC_Overall). Final overall preference counts were 56 for sign, 92 for speech, and 82 for sign plus speech. Overall mode of communication is correlated with hearing levels, with higher trend of oral usage among those with mild/moderate hearing loss and sign language usage among those with profound hearing loss (non-CI users).

Perceived parent–youth communication variable. Although an actual assessment of competence and interaction between the parent–youth dyads would have provided a direct measure of how much the youth understood what their parents said, the cost involved in employing clinically trained interviewers to observe and document youth’s understanding level would have been prohibitive in this large-scale study. We have restricted ourselves to obtaining youth’s perception of how much they understood what their parents said. The item “How much do you understand when your parents communicate with you at home?” was selected as the variable of interest for youth’s perceived level of understanding what their parents said. Of 228 youth who answered this item, 41% of youth participants ($N = 94$) stated that they understood *all* of what their parents said and 46% of youth participants ($N = 105$) understood *most* of what their parents said. The remaining 13% of youth participants ($N = 29$)

reported that they understood some, little, or none of what their parents said.

Statistical analyses. For the first aim, direct statistical comparison using multiple one-way analysis of covariance (ANCOVA) was conducted to test for significant differences between means of generic youth quality of life (YQoL-R) and DHH-specific youth quality of life (YQoL-DHH) across youth preferred mode of communication. For the second specific aim, multiple one-way ANCOVAs were also conducted to test for significant differences between means of generic youth quality of life (YQoL-R) and DHH-specific youth quality of life (YQoL-DHH) across perceived parent–youth communication. For these multiple comparisons, p values were adjusted using Sidak correction (Nakagawa, 2004). We preferred Sidak correction over the more conservative Bonferroni correction to reduce the risk of committing a Type I error based on multiple comparisons.

Demographic and health-related variables were examined for significant correlations with any of the dependent variables in this study and entered in respective ANCOVA models. Evaluation of the youth's level of hearing loss as a possible covariate was not associated with any of the dependent variables and therefore not entered as a covariate in any of ANCOVA models.

For the first specific aim with mode of communication (MoC_Overall) as the predictor variable, ANCOVA models included youth reported depressive symptoms (CDI-S), age, and parent's hearing status as covariates. Perceived level of parent–youth understanding significantly correlated with all generic (YQoL-R) and DHH-specific YQoL (YQoL-DHH) domains and was added to the list of covariates in the ANCOVA model.

For the second specific aim, similar covariates were entered in separate ANCOVA models with perceived level of parent–youth understanding as the predictor variable. Mode of communication was also entered as a covariate in the model. Welch's test was used in analyses where assumptions for homogeneity were not met. To remedy skewed perceived stigma data in the YQoL-DHH data set, a constant of 1 was added to bring all data to nonzero value and log-transformation method was applied to positive scores prior to model

analysis, and adjusted geometric means were obtained by back transformation.

Pairwise comparisons with Sidak corrections were conducted. For the univariate analyses, $n = 230$ proved sufficient using Cohen's (1988) calculations of sample size based on power analysis to detect a small effect size (partial $\eta^2 = .05$).

Results

Youth demographic characteristics are presented in Table 1. The final sample included 230 youths (mild/unilateral = 27, moderate/moderate-severe = 46, severe/profound = 94, CI = 63). Mean age was 14 years old (standard deviation = 2.2). Approximately 44% of youth participants were educated at schools where there was no DHH program, whereas 25% attended schools that provided DHH services. The rest of the youth either attended day/residential programs for the deaf (27%) or were homeschooled (4%). The sample was approximately 51% male, which is representative of youth with various degrees of hearing loss (Gallaudet Research Institute, 2006). More than 85% of the current youth sample reported that they understood most or all of what their parents said.

Based on the entire sample ($n = 230$), a one-way ANCOVA with mode of communication as the independent variable was nonsignificant for YQoL (generic) outcomes. Mode of communication variable accounted for less than 0.5% of variances in the model. Youth who used solely sign language or spoken language to communicate were not significantly different from youth who used a combination of sign and speech in their perception of generic quality of life. However, for DHH-specific quality of life, significant group differences emerged only for perceived stigma domain, $F(2,213) = 5.00$; $p < .008$, $\eta_p^2 = .05$. Within this domain, youth who used speech as their primary mode of communication had significantly worse perceived stigma score than other youth who used combination of speech and sign as their preferred mode of communication (see Figure 1). No significant group differences emerged for participation and self-acceptance and advocacy domains.

Table 1 Sample characteristics of youth by mode of communication, shown in percent of sample

	Mode of communication			
	Total sample (<i>n</i> = 230)	Sign (<i>n</i> = 56)	Speech (<i>n</i> = 92)	Sign and speech (<i>n</i> = 82)
Hearing level				
Mild/unilateral	11.7	0.0	19.6	11.0
Moderate/moderate-severe	20.0	3.6	33.7	15.9
Severe/profound	40.9	87.5	10.9	42.7
Cochlear implant	27.4	8.9	35.9	30.5
Parent				
Deaf/hard of hearing	16.1	39.3	1.1	17.1
Hearing	83.9	60.7	98.9	82.9
Sex				
Male	51.3	44.6	54.3	52.4
Female	48.7	55.4	45.7	48.7
Ethnicity				
White	61.1	55.4	64.4	61.3
Hispanic/Latino	15.0	23.2	10.0	15.0
African American	6.6	5.4	6.7	7.5
Asian/Pacific Island	3.1	5.4	1.1	3.8
Native American	4.0	3.6	5.6	2.5
Biracial/other	10.2	7.1	12.2	10.0

Separate one-way ANCOVA with perceived level of parent–youth understanding as the independent variable (Table 2) showed that **the greater the perception that (s)he understood what her or his parents said, the more likely the youth reported both better generic and hearing loss–specific quality of life.** Youth perceived level of parent–youth understanding variable

accounted for between 7 and 12% of variances in the models. Pairwise comparisons with Sidak corrections were conducted (see Table 3). Results indicated that **youth who reported full understanding of what their parents said also reported significantly better quality of life** related to self, environment, and relationship on YQoL-R instrument than youth who

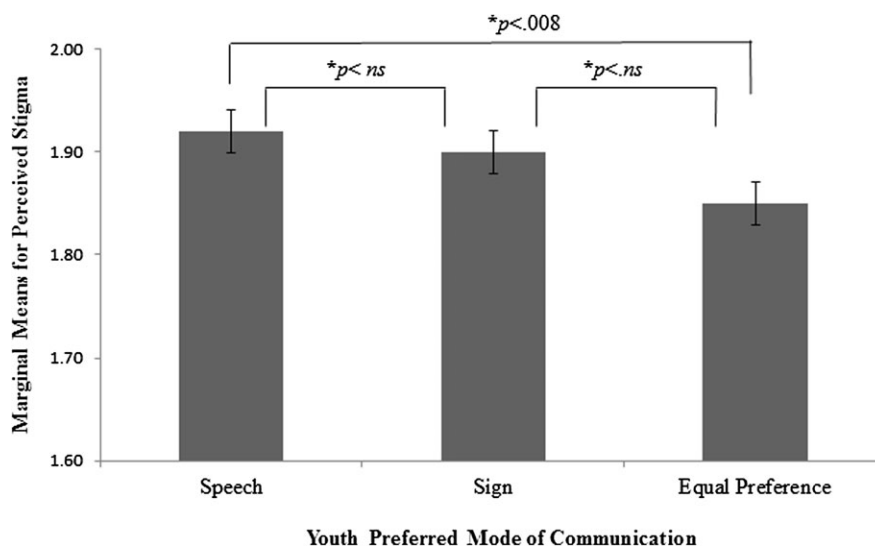


Figure 1 Marginal means of perceived stigma scores by youth mode of communication. *Alpha = .05, adjusting for perceived level of understanding, depression, age, and parent's hearing status. *Note.* Lower perceived score is better.

Table 2 ANCOVA models on YQoL-R and YQoL-DHH domains by perceived parent–youth level of understanding

	All of what they say Adjusted mean (<i>SE</i>)	Most of what they say Adjusted mean (<i>SE</i>)	Some to none of what they say Adjusted mean (<i>SE</i>)	<i>F</i> ^a	Significance ^a	Partial η^2
YQoL-self	72.18 (1.4)	69.48 (1.3)	63.83 (2.6)	3.80	.02	.038
YQoL-environment	87.06 (1.3)	84.79 (1.1)	79.40 (2.3)	4.05	.02	.038
YQoL-relationship	84.34 (1.5)	80.60 (1.4)	73.95 (2.8)	5.18	.01	.048
YQoL-generic Welch test	87.68 (1.7)	83.55 (1.6)	79.68 (3.1)	6.63	.002	.026
YQoL_DHH-participation	67.40 (1.9)	54.55 (1.8)	50.71 (3.6)	14.07	.001	.119
YQoL_DHH-acceptance/advocacy	78.00 (1.4)	75.43 (1.3)	66.74 (2.6)	6.60	.002	.059
YQoL_DHH-perceived stigma ^b	19.17 ^c (0.01)	18.89 ^c (0.01)	18.57 ^c (0.03)	2.05	.13	.019

Note. ANCOVA, analysis of covariance; DHH, deaf or hard of hearing; ns, not significant; *SE*, standard error; YQoL-R, Youth Quality of Life-Revised; YQoL-DHH, Youth Quality of Life—Deaf and Hard-of-Hearing.

^aAdjusted for mode of communication, age, parent hearing status, and reported depression symptoms (CDI-S score).

^bYQoL_DHH-perceived stigma: Higher scores are associated with greater perceived stigma. To remedy highly skewed perceived stigma data, a constant of 1 was added to bring all data to non-zero value and log-transformation method was applied to positive scores prior to model analysis, and adjusted geometric means are obtained by back-transformation.

^cAdjusted geometric means.

reported partial understanding of what their parents said. Significant group differences between youth who understood all of what their parents said and youth who understood some to none of what their parents said also emerged on most domains of the YQoL-DHH instrument.

For the “participation” domain of the YQoL-DHH instrument, pairwise comparison revealed significantly higher scores among youth who understood *all* of what their parents said than youth who reported that they understood *most* of what their parents said. In contrast, pairwise comparison for “self-acceptance and advocacy” domain within YQoL-DHH instrument indicated that youth who understood all or most of what their parents said had significantly higher scores than youth who understood some or none of what their parents said. For the “perceived stigma” domain, youth who reported that they understood some to none of what their parents said had comparable perception of stigma associated with being DHH as do youth who reported that they understood most or all of what their parents said.

When youth reported depressive symptomatology (CDI-S) was entered as a covariate in the ANCOVA models, its effect size ranged from 15 to 25% of the variance in the models. Depressive symptoms accounted for greater variance in its contribution to perceived quality of life than either youth preferred

mode of communication or perceived level of parent–youth understanding, both of which yielded small effect sizes in ANCOVA models for YQoL-R and YQoL-DHH.

Post hoc contrast analyses were conducted on the CDI-S as a dependent variable with mode of communication and perceived level of parent–youth understanding as independent variables in ANCOVA model. **Reported depressive symptoms did not differ across the three modes of communication** ($p =$ not significant). However, significant main effect emerged for perceived level of parent understanding, $F(2,207) = 4.98$; $p < .008$, $\eta_p^2 = .05$. As shown in Figure 2, pairwise comparison indicated that **depressive symptoms were significantly higher among youth who reported that they understood *some* or *little* of what their parents said compared with those who said they understood *most* or *all* of what their parents said**. There were no significant group differences in the depressive symptom scores between youth who understood *most* of what their parents said and youth who understood *all* of what their parents said.

Discussion

In sum, our results demonstrate that youth who perceived that they understood all or most of their parent’s expressive communication, report a higher

Table 3 Pairwise comparison of models on YQoL-R and YQoL-DHH domains across levels of youth's perceived ability to understand parent communication

YQoL-self	Mean difference	SE	Significance ^a
All of what they say versus most of what they say	2.71	1.92	ns
Most of what they say versus some to none of what they say	5.65	2.81	ns
All of what they say versus some to none of what they say	8.35	3.04	.02
YQoL-environment			
All of what they say versus most of what they say	2.27	1.73	ns
Most of what they say versus some to none of what they say	5.39	2.50	ns
All of what they say versus some to none of what they say	7.66	2.7	.02
YQoL-relationship			
All of what they say versus most of what they say	3.75	2.06	ns
Most of what they say versus some to none of what they say	6.65	3.04	ns
All of what they say versus some to none of what they say	10.39	3.27	.01
YQoL-generic			
All of what they say versus most of what they say	4.47	2.45	ns
Most of what they say versus some to none of what they say	4.28	3.56	ns
All of what they say versus some to none of what they say	8.75	3.81	ns
YQoL_DHH-participation			
All of what they say versus most of what they say	12.84	2.65	.001
Most of what they say versus some to none of what they say	3.84	3.90	ns
All of what they say versus some to none of what they say	16.68	4.18	.001
YQoL_DHH-acceptance/advocacy			
All of what they say versus most of what they say	2.57	2.00	ns
Most of what they say versus some to none of what they say	8.69	2.90	.009
All of what they say versus some to none of what they say	11.26	3.11	.001
YQoL_DHH-perceived stigma ^b			
All of what they say versus most of what they say	0.02 ^c	0.02	ns
Most of what they say versus some to none of what they say	0.04 ^c	0.03	ns
All of what they say versus some to none of what they say	0.06 ^c	0.03	ns

Note. DHH, deaf or hard of hearing; ns, not significant; SE, standard error; YQoL-R, Youth Quality of Life-Revised; YQoL-DHH, Youth Quality of Life—Deaf and Hard-of-Hearing.

^aAdjusted for age, parent hearing status, mode of communication, and reported depression symptoms (CDI-S score).

^bYQoL_DHH-perceived stigma: Higher scores are associated with greater perceived stigma. To remedy highly skewed perceived stigma data, a constant of 1 was added to bring all data to nonzero value and log-transformation method was applied to positive scores prior to model analysis, and adjusted geometric means are obtained by back-transformation.

^cAdjusted geometric means.

perceived quality of life related to their sense of self, their relationships and their environment as well as better quality of life related to being DHH. Within the YQoL-DHH module for youth quality of life instrument, the youth's perception of full understanding of parent's communication is important for high participation-related quality of life. Youth who understood most or all of what their parents say were likely to report higher quality of life related to self-acceptance and advocacy and also lower perceived stigma related to being DHH. These perceptions did not differ by degree of hearing loss but rather were consistent across the range of loss from mild to severe

as well as among youth with CIs. Preferred communication modality was not related to the youth's evaluation of how much she or he understood the parent, perceived quality of life associated with participation and self-acceptance/advocacy, or the youth's report of depressive symptoms. Perceived stigma associated with being DHH, however, was significantly associated with mode of communication. Specifically, youths who reported strong preference for speech were much more likely to report greater stigma associated with being DHH than youths who reported preference for combination of sign language and speech. The addition of sign language to the DHH youth's daily

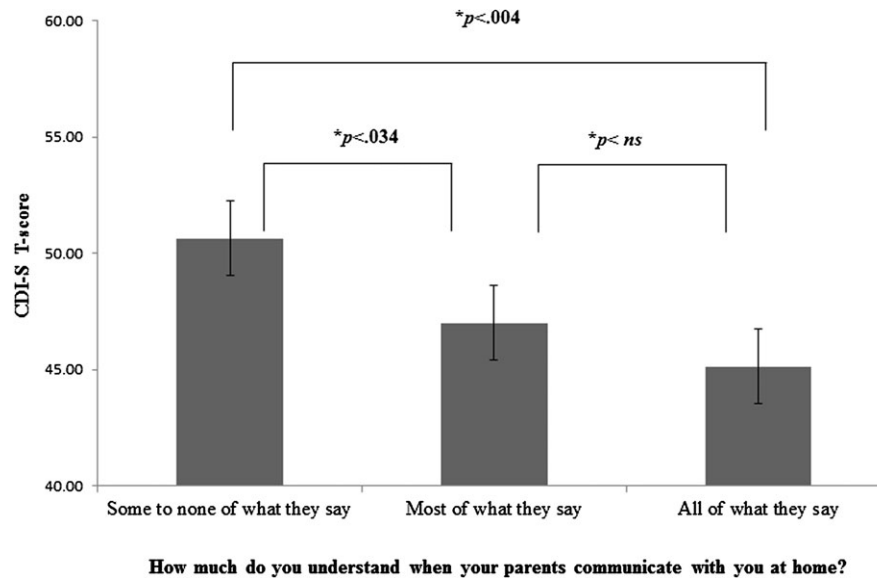


Figure 2 Means of youth reported depressive symptoms (CDI-S) by youth's perceived ability to understand parent communication. *Alpha level = .05, adjusting for perceived level for mode of communication, age, and parent's hearing status. *Note.* Lower CDI-S *T*-score is better.

communication appears to carry a beneficial effect in reducing youth perceived stigma associated with hearing loss. Finally, the relationship found between youth's perceived ability to understand what their parents said and generic quality of life is consistent with previous research that suggest a link between communicative competence (as opposed to preferred mode of communication) and socioemotional development among youth who are DHH (Hintermair, 2006).

Our finding of the association between perceived quality of life and youths' perceptions of their ability to understand what their parents say underscores the importance of the quality of communication at home. Conversely, the parent's perception of the DHH youth's communication may be equally important in shaping developmental outcomes. In other words, the outcomes of the DHH child's early experience are influenced by a combination of factors intrinsic to the child and environmental modifications (Marschark, 2007). Closer examination of this bidirectional relationship, rather than the youth or parent's characteristics, is necessary in order to adequately understand the impact that basic parent–youth communication would have on DHH-specific quality of life outcomes.

Research has shown that better problem solving skills among parents are associated with better academic

and socioemotional development in their deaf children (see Calderon & Greenberg, 2003, for a review). Lower parental stress and depression are associated with better socioemotional development in children who are DHH (Hintermair, 2006; Kushalnagar et al., 2007). These studies point to the same conclusion: early communication difficulties appear to be associated with parental stress and socioemotional difficulties among children who are DHH. As we tie in these data with current study findings, it may be logical to conclude that the quality of communication at home is not only just related to the child's early socioemotional and language development but also related to later quality of life issues in adolescence. It emphasizes the need to consider home communication across the age span as a malleable factor that deserves attention for its proximal role in satisfaction with school and life.

The relatively small percentage of youth who reported less than optimal understanding of parent's expressive communication also reported more depressive symptoms than youth who reported that they understood most or all of what their parents said. The association between perceived level of ability to understand what parents said and depressive symptoms remained moderately strong after taking in consideration the youth's preferred mode of

communication, age, parent's hearing status, and the youth's level of hearing loss. If the depressed youth does not perceive communication with hearing parents to be accessible, this youth may sense a loss of belonging, thus negatively impacting his or her perceived quality of life related to life at home. This can potentially place the youth at increased risk for engaging in health-risk behaviors such as tobacco use, alcohol use, illicit drug use, and high-risk sexual behavior, which has also previously been shown to be associated with a poor quality of life (Topolski et al., 2001). These health-risk behaviors also have been shown to be associated with depression and anxiety that emerge during adolescence (see DiClemente, Santelli, & Crosby, 2009, for a review), and depression and hopelessness have been shown to be associated with lower perceived quality of life (Moore, Hofer, McGee, & Ring, 2005).

For the general youth population without disabilities, parental involvement and parent-youth communication have been shown to be influential on various youth outcomes such as reduction in sexual risk behaviors (DeVore & Ginsburg, 2005; Stoiber & McIntyre, 2006), better academic achievement (Hill et al., 2004), and overall adolescent adjustment (see Proctor, Linley, & Malthy, 2009, for a review). Parent monitoring has been found to significantly reduce adolescent risk behaviors, including tobacco, marijuana, and illicit drug usage (Robertson, Baird-Thomas, & Stein, 2008; Stanton et al., 2004). In these parent-youth communication studies that involve hearing youth and hearing parents, parent-youth communication is typically high level and focuses on what messages are sent, what messages are heard, and what messages are understood. For deaf youth who do not have accessible communication at home, we must first address the basic issue of whether they felt that they understood how much their parents said before we can move on to higher level parent-youth communication. Another issue to consider is the degree of language proficiency that may differ between the parent and youth. For example, the parent may not be as proficient in sign language as the youth or the youth not as proficient in spoken English as the parent. This may add yet another layer of complexity in understanding each other's basic communication and create stress within

the parent-youth relationship. Within this context, both the parent and the youth's ability to be flexible, recognize, and problem solve in communication breakdowns can serve to improve the relationship and maintain healthy parent-youth connection as well as promote positive youth perceived quality of life. These issues further emphasize the importance of making entire families the participants or consumers of communication interventions with DHH children and youth; the goal of most early intervention programs (see Sass-Lehrer & Bodner-Johnson, 2003; Stredler-Brown, 2010). Future mental health and family communication intervention studies with DHH youth are needed to discern the causal relationships among depressive symptoms, perceived ability to understand parent's communication, and perceived quality of life.

One study limitation is the nature of convenience sampling. A large percentage of youth participants were recruited through schools, listserves, and camps. Written consents from the parents were required prior to surveying youth participants. The self-selection process associated with parental consent may be reflective of educated and literate parents who are already involved in their children's lives, which may explain the higher number of positive perception of parent expressive communication and associated quality of life. Better sampling methods to include hard-to-recruit participants are needed to provide a wider representation of the young population and their perception of quality of life in general and as DHH individuals.

Conclusions

The study bears important implications for improving youth perceived quality of life and depressive symptoms of DHH youth who perceive parent communication to be difficult. It emphasizes that quality of communication among family members remains essential even when youth with hearing loss are in their adolescent years. In keeping with reports of the benefits of positive perception on parent's level of understanding and associated reduction in youth's depressive symptoms as well as an increase in perceived quality of life, an effort should be made to

identify youth at risk for communication problems at home. An important contribution of this study is that youth report of their perceived level of communication was found to be related to their quality of life. **This simple self-report should be an important component in therapy, where providers may also need to ask about home communication and consider it an important and malleable factor in the youth's life. By including parents and youth in therapy sessions, providers may be able to empower both the parent and the youth to be active problem solvers in preventing communication breakdowns. Whenever possible, measures (e.g., sign language, assistive hearing devices if beneficial to the youth, family counseling) should be taken to provide the youth with access to communication at home. Combined together, these can help increase the youth's perception of self as well as overall quality of life.**

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Conflicts of Interest

No conflicts of interest were reported.

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