

Parental self-efficacy and early language development in deaf and hard-of-hearing children

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Abstract

This study examined the relationship between parental self-efficacy in parents of young deaf and hard-of-hearing (DHH) children and children's spoken language skills. A retrospective within-subjects study design was used that included 24 mother-child dyads with DHH children. Parental self-efficacy was assessed using the Scale of Parental Involvement and Self-Efficacy-Revised. Children's language abilities were assessed using the Preschool Language Scale-5th edition. Our data revealed no significant associations between global measures of parental self-efficacy and children's auditory comprehension, expressive communication, and total language scores. However, positive correlations were found between child language skills and specific parents' beliefs about their ability to support their child's spoken language development, their ability to use strategies to help their child communicate, and their active involvement in intervention. Findings highlight the importance of examining discrete aspects of parental self-efficacy as it specifically relates to parents supporting their DHH child's spoken language development. Future directions and implications are provided.

A primary goal of family-centered early intervention (FCEI) for children who are deaf and hard-of-hearing (DHH) is for parents and caregivers to acquire a sense of self-efficacy in supporting their child's development in all domains, with an emphasis on fostering language growth (Moeller et al., 2013). The majority of DHH children are born to typically hearing parents; therefore, a diagnosis of deafness is unexpected (Mitchell & Karchmer, 2004). Parents' lack of prior experience or knowledge of how to foster their child's language development after a diagnosis of hearing loss creates the need for parents (inclusive of other caregivers) to acquire new knowledge and skills. FCEI employs evidence-based practices offering parents the opportunity to observe, practice, and receive feedback (Meagan et al., 2018) on strategies (e.g., asking open-ended questions, expansion) that facilitate language development (Desjardin & Eisenberg, 2007). Importantly, parents are coached on how to implement those strategies within the context of their daily lives, thus developing a sense of competence and confidence (i.e., self-efficacy). The focus for most parents is on strategies that will promote expressive and receptive language development. The purpose of this study is to examine the direct relationship between parental self-efficacy and DHH children's spoken language skills.

Parental self-efficacy

Parental self-efficacy, an extension of self-efficacy, is a parents' estimation of their ability to engage in behaviors and tasks that will promote their child's development (Ardelt & Eccles, 2001).

Based on Bandura's Social Cognitive Theory, human development and adaptation occurs through the reciprocal interplay between individual, behavioral, and environmental factors (1997). Self-efficacy is one's perception of their ability to engage in behaviors and tasks that will result in achieving a particular goal. The malleability of self-efficacy, combined with the emergence of parental self-efficacy, as a key predictor of parenting behaviors (e.g., responsivity to children's communication attempts) is associated with positive child outcomes (e.g., better child language skills) (Albanese et al., 2019).

Bandura (1977) posited that individuals gauge their sense of self-efficacy based on mastery experiences (i.e., engaging in a particular task and experiencing success), social modeling or vicarious experience, verbal or social persuasion, and emotional state (e.g., level of stress, anxiety). In the realm of self-efficacy related to parenting, several studies demonstrate the importance of social models, parents who share a social identity (e.g., parent of a child with a disability) in decreasing the effects of parental stress and postpartum depression (e.g., Izzo et al., 2000; Shorey et al., 2015). Observing others as they carry out parenting tasks creates opportunities in which parents can estimate their own ability to carry out that task. Bandura also asserted that parents' perceptions of their ability to successfully carry out their parenting role depends on their psychological or emotional state (e.g., anxiety and stress leading to inaction).

Parental self-efficacy requires knowledge about appropriate childcare responses (e.g., soothing baby), confidence in their

ability to engage in appropriate responses, and the belief that their child will respond contingently (Coleman & Karraker, 1998). It is parents' and caregivers' interpretation, or self-assessment, of their capacity and confidence to effectively parent their children that is the focus; thus, parental self-efficacy reflects a firsthand, subjective view of success, rather than an outsider's view. Previous studies with hearing children have shown that higher levels of parental self-efficacy are related to facilitative parenting behaviors (e.g., more instances of parental responsiveness to child communication behaviors) and child outcomes (for a review see Jones and Prinze, 2005).

A parent might have a positive sense of self-efficacy in the general care of their child, while viewing themselves as less self-efficacious in managing tasks specific to new or unexpected circumstances, such as, for parents of children who are DHH, actively facilitating language development. Parental self-efficacy is also domain and task specific (Wittkowski et al., 2017). In the case of DHH children, parents who receive early intervention services focusing on development more broadly rather than targeting the unique language needs of DHH children might convey a stronger sense of parental self-efficacy in supporting their child's general development compared to facilitating their child's language development.

Parental self-efficacy and language development

Research with typically hearing parent-child dyads demonstrate that parental self-efficacy functions as a predictor of positive parenting behaviors (i.e., responsiveness to infant communication). Subsequently, responsive parenting behaviors are strongly related to children's language growth (Stiévenart & Martinez Perez, 2021). Mothers with a greater sense of parental self-efficacy demonstrate more responsiveness and sensitivity in interactions with their children (Teti et al., 1996), and provide higher-quality linguistic input (e.g., longer utterances, more diverse vocabulary). In contrast, mothers who self-report lower parental self-efficacy demonstrate less positive parenting behaviors, such as fewer contingent responses to their children, use of more directives (Conway et al., 2018), and fewer types of words (Stiévenart & Martinez Perez, 2021), that are not associated with positive language growth.

A recent literature review reported mixed results in investigations of how parental self-efficacy relates to early language development (Stiévenart & Martinez Perez, 2021). Coleman and Karraker (2003) demonstrate significant correlations between high levels of parental self-efficacy specific to language development (i.e., domain-specific parental self-efficacy) and language outcomes in hearing children. In a longitudinal study, Albarran and Reich (2014) report significant correlations between parental self-efficacy of parents of infants (i.e., 2 months) and later expressive and receptive language (i.e., 18 months of age). However, a study with children diagnosed with disabilities associated with communication delays (e.g., general developmental delay, pervasive developmental disorder) indicated no significant association between parental self-efficacy and expressive and receptive language (Harty et al., 2007). Dulay et al. (2018) reported no associations between parental self-efficacy and vocabulary abilities in 3- to 5-year-old children.

Several methodological considerations have been identified related to examining parental self-efficacy and early language development. Parental self-efficacy has been conceptualized in different ways in studies and has sometimes been conflated

with parental confidence or self-esteem (Wittkowski et al., 2017). Stiévenart and Martinez Perez (2021) point to the need for "specific and aligned conceptual relations" in future research. They highlight the need for measuring aspects of early language development, specifically, recommending tools such as the MacArthur-Bates Communication Development Inventory (Fenson, 2007) to assess areas of early social communicative behaviors. Selection of domain-specific measurement tools is essential. This is an important consideration as it relates to DHH children. For parents of DHH children, then, general parental self-efficacy tools may be too broad, as they pertain to parental self-efficacy in general child development, rather than language development.

Parental self-efficacy and language development in DHH children

Early parental self-efficacy studies with mothers of children who are DHH focused on two domains: mothers' belief in their capacity to care for their child's hearing devices (e.g., carrying out daily listening checks, adjusting device settings) and belief in their capacity to nurture their child's spoken language development (e.g., knowledge of how their child develops sounds, belief in the ability to positively affect their child's speech development) (DesJardin, 2003, 2005, 2006). Mothers have rated themselves relatively high in parental self-efficacy in both domains; however, differences emerged based on whether children used cochlear implants or hearing aids. Mothers of children with cochlear implants rate themselves higher in parental self-efficacy compared with mothers of children with hearing aids and consider themselves more involved in their child's early intervention (DesJardin, 2005), a difference DesJardin attributed to DHH children with cochlear implants receiving timelier audiological care and more intensive early intervention services compared to children with lesser degrees of hearing loss.

Directionality between parental self-efficacy and linguistic input (i.e., quality and quantity) remains unspecified; however, studies indicate a positive relationship between parental self-efficacy and parental linguistic input in children who are DHH (e.g., DesJardin, 2006; DesJardin & Eisenberg, 2007). Mothers who view themselves as more self-efficacious provide language that is higher in both quality (i.e., facilitative language techniques) and quantity (i.e., mean length of utterance, number of spoken word tokens and word types); in turn, better quality and quantity of linguistic input are positively related to stronger expressive and receptive spoken language skills (DesJardin & Eisenberg, 2007). A study of mothers of DHH children aged 12–18 months found a positive correlation between perceived maternal self-efficacy and children's early developmental abilities, language skills, and adaptive behavior, and significant negative correlations with children's problem behaviors (i.e., externalizing, internalizing, dysregulation) (Stika et al., 2015). Furthermore, parental self-efficacy plays a mediating role, serving as "buffer" between the negative affect of parental stress on spoken language outcomes (Cejas et al., 2021).

More recently, Ambrose et al. (2020) piloted a revised version of the Scale of Parental Involvement and Self-Efficacy (SPISE-R) with 61 parents of children with hearing aids and cochlear implants between the ages of 4 and 36 months. Results demonstrated that parents' knowledge and confidence scores were significantly associated with action scores and children's auditory access (Ambrose et al., 2020). The SPISE-R reflects multiple elements of parental self-efficacy (i.e., parents' beliefs, knowledge, confidence, and actions), providing an opportunity to delineate

which aspects of parental self-efficacy relate to child outcomes (i.e., language development). Ambrose and colleagues examined the relationship between parents' beliefs, knowledge, confidence, and actions and language outcomes. Perceived confidence levels were associated with children's spoken language scores per the communication scale of the Developmental Profile-3 (Alpern, 2007). Altogether, this body of work has informed our understanding of parental self-efficacy among parents with children who are DHH and highlights the importance of monitoring parental self-efficacy as a means of supporting early language development. Nonetheless, further research is needed to inform aspects of FCEI practices such as providing parents with knowledge and confidence to support their children's language development.

The purpose of the current study is to provide an in-depth examination of specific aspects of parental self-efficacy (i.e., parents' beliefs, knowledge, confidence, and actions) using the newly revised SPISE-R (Ambrose et al., 2020). We also expand on the literature by using a more robust language measure to understand how parental self-efficacy relates to expressive and receptive spoken language skills.

Method

Participants

The present research study was approved by the Institutional Review Board at a major university in the Midwestern United States. Participants were primarily recruited from the clinical caseload at a nearby children's hospital and written consent was obtained prior to study initiation. Participants were evaluated as part of a larger longitudinal study investigating the social dynamics of parent-toddler play interactions (blinded citation). To be included in the present study, participants needed to provide parental self-efficacy and child language scores during the same testing visit. Additional inclusion criteria included (1) hearing aid (HA) fitting or cochlear implant (CI) activation by age 24 months; (2) English as the primary language in the home, defined as >70% in the home; and (3) no comorbid diagnoses. The final sample consisted of 24 dyads. This sample happened to include all mothers (fathers were not intentionally excluded), all of whom identified as White non-Hispanic. At the time of testing, toddlers averaged 33.74 months of age ($SD = 5.90$) and included 12 hearing aid users and 12 cochlear implant users. Etiology of hearing loss was unknown or not reported for most participants. Etiology reported included Pendred syndrome, enlarged vestibular aqueduct syndrome, Connexin, and cytomegalovirus. One child was exposed to Spanish in the home and five children were exposed to American Sign Language (data related to the extent American Sign Language was used in the home were not collected). See Tables 1 and 2 for demographic characteristics.

Measures

Parental self-efficacy

The Scale of Parental Involvement and Self-Efficacy-Revised (SPISE-R) is a self-report questionnaire for parents of children who are DHH (Ambrose et al., 2020). The SPISE-R measures parents' perceptions of their beliefs, knowledge, confidence, and actions when supporting their child's auditory development/auditory access and spoken language development. Items relating to parental beliefs, knowledge, confidence, and actions are rated on a 1 ("not at all") to 7 ("a great deal") Likert scale, such that higher scores indicate higher self-efficacy within a domain. The SPISE-R has strong internal consistency (Cronbach's α values range from .89 to .92), though work is still needed to establish test-retest

Table 1. Parent demographic characteristics.

Characteristics	Parents (n = 24)
Maternal education	
High school graduate	6 (25%)
Associate degree	1 (4.2%)
Bachelor's degree	14 (58.3%)
Master's/PhD/professional degree	3 (12.5%)
Annual household income	
<\$5,500–\$24,999	1 (4.2%)
\$25,000–\$49,999	6 (25%)
\$50,000–\$99,999	6 (25%)
≥\$100,000	10 (41.6%)
No response	1 (4.2%)

Table 2. Child demographic characteristics.

Characteristic	M (SD; range)
Age at test (months)	33.74 (5.9; 27–52)
Hearing device	
Hearing aids ^a	12 (50%)
Cochlear implants ^b	12 (50%)
Age at first CI activation	
≤12 months	9
≥12 months	1
Age at first HA fitting	
≤3 months	2
≥3 months	4
Sex	
Female	13
Male	11
Race/ethnicity	
White/non-Hispanic	24 (100%)

^aAge at first hearing aid fitting is missing for five children. ^bAge at first cochlear implant activation is missing for one child.

reliability and construct validity (Ambrose et al., 2020). Parents completed the SPISE-R through REDCap, a secure web application for building and managing online surveys and collecting data.

Scores on the Beliefs domain are reported item by item (rather than resulting in a total section score), allowing for between-item comparisons. Three items are positively keyed indicating higher scores are desirable: (a) if children are given the right supports, they can overcome the effects of hearing loss, (b) how my family talks to and interacts with my child will have a big impact on how my child develops, and (c) my child's hearing devices help him/her communicate. Four items are negatively keyed, indicating that disagreement is more desirable: (d) no matter what we do as a family, my child's development will be delayed compared to children with normal hearing; (e) if people see my child wearing his/her hearing devices, they will judge my child or family; (f) if I keep my home too quiet, my child won't learn to listen in noise; and (g) if children wear their hearing devices all the time, they will become overly dependent on them. The negatively keyed items are reversed scored upon completion of the section.

The Knowledge, Confidence, and Actions sections include items specific to auditory development/auditory access or facilitating spoken language development. Example items from the Knowledge section include (a) how to manage my child's hearing devices, (b) how to share a book with my child in a way that helps him/her learn to communicate, and (c) strategies the interventionist recommends using to help my child learn to communicate. The Confidence section includes items such as

Table 3. SPISE-R Beliefs descriptive data.

Code	Items	M	SD	Range
B1	"If children are given the right supports, they can overcome the effects of hearing loss"	6.29	1.23	2–7
B2	"How my family talks to and interacts with my child will have a big impact on how he/she develops"	6.67	0.48	6–7
B3	"No matter what we do as a family, my child's development will be delayed compared to children with normal hearing"	6.00	1.18	3–7
B4	"My child's hearing device(s) help him/her learn to communicate"	6.63	0.71	4–7
B5	"If people see my child wearing his/her hearing device(s), they will judge my child or my family"	5.38	1.21	3–7
B6	"If I keep my home too quiet, my child won't learn to listen in noise"	4.46	1.64	2–7
B7	"If children wear their hearing device(s) all the time, they will become overly dependent on them"	6.29	0.91	4–7

Note. Items were scored on a 7-point Likert scale; 1 = not at all, 7 = a great deal.

(a) put and keep my child's hearing devices on him/her, (b) help my child hear by making changes in his/her environment, and (c) help my child learn to say new sounds, words, or sentences. The Actions section includes items such as (a) make sure other people caring for my child know how to help my child learn to communicate, and (b) advocate for my child's needs in intervention sessions and IFSP/IEP (Individualized Family Service Plan/Individualized Education Program) meetings. The Actions section also includes items related to parental involvement in intervention. A final section queries parents on their child's sensory auditory access (e.g., number of hours used during waking hours).

Language skills

The Preschool Language Scales-Fifth Edition (PLS-5) is a play-based assessment which measures receptive and expressive language skills in children from birth to age 7 years (Zimmerman et al., 2011). It is a well-validated norm-referenced assessment, with strong psychometric properties (internal consistency $r = .93-.98$, test-retest stability $r = .96-.98$; Zimmerman et al., 2011). The PLS-5 provides standard scores for auditory comprehension, expressive communication, and a composite total language score ($M = 100$, $SD = 15$). In the present study, the PLS-5 was administered in spoken English by a research speech-language pathologist with experience assessing children who are DHH.

Data analyses

Descriptive statistics were carried out for each domain (parental beliefs, knowledge, confidence, and actions) of the SPISE-R. Correlations between SPISE-R and PLS-5 scores were carried out to examine the relationship with parental self-efficacy and child language skills. Consistent with previous findings, we predicted that higher parental self-efficacy scores would be associated with higher child language scores.

Results

Parental self-efficacy Beliefs

The Beliefs domain queries parents on how much they share beliefs concerning auditory development/auditory access and supporting spoken language development in their children. The average scores for all seven items were above the midpoint of 4 on the scale (range = 4.46–6.67), indicating that mothers tended to endorse items above "Somewhat." The range for individual item endorsement varied, such that two items revealed a range of scores from 2 to 7, two items revealed a range of scores from 3 to 7, while the remaining three items revealed a range of scores from 4 to 7. See Table 3 for item-by-item data on parents' beliefs.

Knowledge, confidence, and actions

Average scores for knowledge, confidence, and actions were relatively high ($M = 6.1$, $SD = 0.68$, $M = 6.17$, $SD = 0.73$, and $M = 6$, $SD = 0.61$, respectively). Scores for auditory access and spoken language development subsections contribute some variability to total section scores. See Table 4 for descriptive data for parents' knowledge, confidence, and actions.

An item-by-item analysis of the Knowledge, Confidence, and Actions sections indicate variability (range 0.62–2.25, respectively) in parents' perception of their knowledge, confidence, and ability to act related to auditory access and spoken language development. Mean scores on the Knowledge section indicate little variability in parents' knowledge about auditory access and spoken language development (range 6.33–5.71).

The Actions section mean scores indicate the highest variability ranging from 4.21 ($SD = 1.89$) for "Daily check of my child's listening with the Ling 6-Sound test (ah, ee, oo, m, sh, s)" on the low end and 6.46 (0.88) for "Mak[jing] sure other people caring for my child know how to manage my child's hearing device(s)." Parents rated items for their involvement in intervention very high, within 0.6 of the highest score with little variability (range 6.4–6.79). See Tables 5–7 for item-by-item descriptive data.

Language skills

On average, children's total language scores fell within 1 SD of the normative mean of 100 ($M = 97.54$, $SD = 15.37$). Children's total language scores varied, and as expected, their standard scores exhibited wide variability (range 63–127). Auditory comprehension and expressive communication were also within 1 SD of the mean and widely variable ($M = 98.46$, $SD = 14.40$, range 60–127 and $M = 97.38$, $SD = 12.58$, range 69–123, respectively).

Correlations between parental self-efficacy and child language skills

A series of Pearson bivariate correlation calculations were carried out to examine the relationship between parental self-efficacy and child language outcomes. Generally, parents' sense of self-efficacy did not correlate with language outcomes. Statistically significant correlations were not found between the Knowledge, Confidence, and Actions sections of the SPISE-R and auditory comprehension, expressive communication, and total language scores on the PLS-5 ($p > .05$).

However, several individual items among the Beliefs and Actions sections were positively correlated with auditory comprehension, expressive communication, and/or total language scores. The SPISE-R belief item "No matter what we do as a family, my child's development will be delayed compared to children with normal hearing" was weakly to moderately positively correlated with children's auditory comprehension ($r = .45$, $p = .03$) and

Table 4. SPISE-R Knowledge, Confidence, and Actions descriptive data

	Knowledge			Confidence			Actions		
	M	SD	Range	M	SD	Range	M	SD	Range
Auditory access subsection	6.17	0.73	5–7	6.23	0.66	4.6–7	5.72	0.87	4.14–7
Language development subsection	6.06	0.93	3.4–7	6.10	0.80	4.8–7	6.23	0.74	4.8–7
Involvement in intervention	–	–	–	–	–	–	6.71	0.4	6–7
Total section	6.1	0.68	4.6–7	6.17	0.73	4.9–7	6	0.61	5–7

Note. Items were scored on a 7-point Likert scale; 1 = not at all, 7 = a great deal/very/always for Knowledge, Confidence, and Actions, respectively.

Table 5. SPISE-R Knowledge item-by-item descriptive data

	M	SD	Range
Auditory items			
How to manage my child's hearing device(s)	6.29	0.91	4–7
Strategies to use to keep my child's hearing device(s) on him/her	6.17	1.05	3–7
What my child can and cannot hear WITHOUT his/her hearing device(s)	5.71	1.6	1–7
What my child can and cannot hear WITH his/her hearing device(s)	6.04	1.08	3–7
How to do the Ling 6-Sound test (ah, ee, oo, m, sh, s)	6.5	0.78	5–7
Language development items			
The sounds, words, or sentence types my child should be learning to say	6.04	1.12	3–7
How to help my child learn to communicate	6.12	1.19	2–7
How my child's learning is affected by his/her hearing loss	5.71	1.37	2–7
How to share a book with my child in a way that helps him/her learn to communicate	6.08	1.02	4–7
Strategies the interventionist recommends using to help my child learn to communicate	6.33	0.7	5–7

Note. Items were scored on a 7-point Likert scale; 1 = not at all, 7 = a great deal.

Table 6. SPISE-R Confidence item-by-item descriptive data

	M	SD	Range
Auditory access items			
Determine if my child's hearing device(s) are working okay	6.50	0.66	5–7
Put and keep my child's hearing device(s) on him/her	6.54	0.78	4–7
Help my child hear by making change in his/her environment	6.00	1.5	2–7
Help my child hear and understand new speech sounds or sounds in his/her environment	6.00	1.2	2–7
Find out if my child is hearing okay by using the Ling 6-Sound test (ah, ee, oo, m, sh, s)	6.17	1.13	3–7
Language development items			
Help my child learn to say new sounds, words, or sentences	6.17	0.87	4–7
Help my child communicate what he/she wants and needs	5.83	1.05	3–7
Communicate with my child in a way that is appropriate to address his/her hearing needs	6.04	1.04	3–7
Share books with my child in a way that helps him/her learn to communicate	6.12	1.04	4–7
Do the things I learned during intervention sessions when the professional is not there to help me	6.33	0.76	5–7

Note. Items were scored on a 7-point Likert scale; 1 = not at all, 7 = very.

moderately positively correlated with expressive communication ($r = .64, p < .001$) and total language ($r = .55, p = .01$).

Two items in the Actions section revealed weak to moderate positive correlations with language outcomes. Higher self-ratings on "Use strategies to help my child communicate his/her wants and needs" were weakly to moderately positively related to children's expressive communication ($r = .45, p = .03$) and total language scores ($r = .43, p = .04$). Higher self-ratings on "Attend and be involved in my child's intervention sessions (instead of having to do other things during that time, such as prepare meals or take care of siblings)" was weakly positively related to children's expressive communication ($r = .47, p = .02$). No significant correlations were found between SPISE-R Confidence items and PLS-5 scores. See Tables 8 and 9 for correlations.

Discussion

The purpose of this study was twofold: first, to examine the relationship between parental self-efficacy specific to auditory

access and spoken language development and children's spoken language outcomes; then, to examine the relationship between aspects of parental self-efficacy (beliefs, knowledge, confidence, actions) related to those domains. Our findings indicate no statistically significant correlations between parental self-efficacy and auditory comprehension, expressive communication, and overall language abilities. However, positive correlations were found between child language skills and parents' perceptions of their ability to support their child's spoken language development, to use strategies to help their child communicate, and be actively involved in intervention.

Parental self-efficacy beliefs

Parents' self-ratings on belief items reflected trends demonstrated in the initial SPISE-R study conducted by Ambrose et al. (2020). In both studies, parents expressed strong agreement with the belief that how the family talks to and interacts with their DHH child can have a "big impact" on how their child develops. Of

Table 7. SPISE-R Actions item-by-item descriptive data.

	M	SD	Range
Auditory access items			
Daily listening checks on my child's hearing device(s)	4.92	1.98	1–7
Make sure other people caring for my child know how to manage my child's hearing device(s)	6.46	0.88	4–7
Make sure I, or someone else, puts my child's hearing device(s) on immediately AFTER HE/SHE WAKES UP	6.33	0.76	4–7
Make sure I, or someone else, puts my child's hearing device(s) on immediately IF THEY FALL OFF OR my child TAKES THEM OFF	6.21	0.98	4–7
Make sure my child's environment makes it as easy as possible for him/her to hear	6.04	0.81	4–7
Draw my child's attention to sounds in speech or the environment that he/she is still learning or might not have heard	5.88	1.19	3–7
Daily check of my child's listening with the Ling 6-Sound test (ah, ee, oo, m, sh, s)	4.21	1.89	1–7
Language development items			
Use strategies during our daily activities to help my child learn to say new sounds words, or sentences	6.21	0.88	4–7
Use strategies to help my child communicate his/her wants and needs	6.33	0.82	4–7
Make sure other people caring for my child know how to help my child learn to communicate	6.17	0.82	4–7
Share books with my child at least one time a day	6.25	0.94	4–7
Use the strategies I learned during intervention sessions to help my child learn to communicate	6.17	0.87	5–7
Involvement in intervention items			
Advocate for my child's needs in intervention sessions and IFSP/IEP	6.54	0.78	4–7
Get my child to the audiologist as soon as a visit is needed	6.79	.42	6–7
Attend and be involved in my child's intervention sessions (instead of having to do other things during that time, such as prepare meals or take care of siblings)	6.79	0.42	6–7

Note. Items were scored on a 7-point Likert scale; 1 = not at all, 7 = always. IFSP = Individualized Family Service Plan; IEP = Individualized Education Program.

Table 8. Correlations between SPISE-R Beliefs items and PLS-5 standard scores.

		Auditory comprehension	Expressive communication	Total language
B1	Pearson correlation	.345	.279	.324
	Sig. (2-tailed)	.098	.188	.122
B2	Pearson correlation	.209	.359	.278
	Sig. (2-tailed)	.327	.085	.188
B3	Pearson correlation	.454	.636	.547
	Sig. (2-tailed)	.026*	<.001**	.006**
B4	Pearson correlation	–.257	–.261	–.275
	Sig. (2-tailed)	.226	.219	.193
B5	Pearson correlation	–.135	–.058	–.110
	Sig. (2-tailed)	.531	.787	.610
B6	Pearson correlation	–.026	–.051	–.046
	Sig. (2-tailed)	.903	.814	.829
B7	Pearson correlation	–0.10	–0.17	–0.14
	Sig. (2-tailed)	.64	.43	.51

Note. See Table 3 for beliefs items according to codes. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

note, parents in the Ambrose et al. (2020) sample whose children did not have an immediate DHH family member were more likely to strongly express this belief compared to parents of children without an immediate DHH family member.

Both studies found that parents expressed the least agreement with the beliefs that “If I keep my home too quiet, my child ‘won’t learn to listen in noise’” and “If people see my child wearing his/her hearing device(s), they will judge my child or my family.” For families who are committed to their child using sensory devices consistently, these findings suggest the need for early intervention providers to address parents’ worry about their child or family being judged (e.g., provide social support by introducing the family and child to DHH adults and other families) and guide them in attending to noise levels in the home and making adjustments. In sum, the findings about parents’ beliefs indicate the positive impact that interacting with DHH adults who also use sensory devices can have on parents’ understanding and acceptance of their child.

Parental self-efficacy related to auditory access Knowledge

Our results demonstrate that parents view themselves as most knowledgeable about auditory access compared to facilitating spoken language development. Parents rated themselves as most knowledgeable about what their child can hear with their devices and how to carry out a Ling 6-Sound test, and least knowledgeable about what their child can and cannot hear without their devices. Average knowledge scores were higher in the current sample compared to Ambrose et al. (2020) and within a narrower range. Ambrose et al. (2020) did not include an item-by-item analysis for the Knowledge, Confidence, and Actions sections; therefore, a direct comparison cannot be made. However, this finding may be attributed to families not receiving early intervention services from providers who specialize in early language development in DHH children. DHH children benefit from FCEI interventions that emphasize language development and involves coaching families in implementing strategies in their daily lives.

Table 9. Correlations between SPISE-R Actions items and PLS-5 standard scores.

		Auditory comprehension	Expressive communication	Total language
Act_aud_1	Pearson correlation	.024	-.065	-.020
	Sig. (2-tailed)	.910	.762	.926
Act_aud_2	Pearson correlation	.123	.125	.131
	Sig. (2-tailed)	.566	.562	.540
Act_aud_3	Pearson correlation	.181	.377	.266
	Sig. (2-tailed)	.397	.070	.208
Act_aud_4	Pearson correlation	.046	.170	.094
	Sig. (2-tailed)	.831	.427	.664
Act_aud_5	Pearson correlation	.288	.324	.307
	Sig. (2-tailed)	.172	.122	.145
Act_aud_6	Pearson correlation	.122	.122	.127
	Sig. (2-tailed)	.569	.569	.553
Act_aud_7	Pearson correlation	-.284	-.293	-.293
	Sig. (2-tailed)	.179	.165	.164
Act_lang_1	Pearson correlation	.100	.259	.177
	Sig. (2-tailed)	.643	.222	.408
Act_lang_2	Pearson correlation	.380	.453*	.425*
	Sig. (2-tailed)	.067	.026	.038
Act_lang_3	Pearson correlation	.038	.171	.093
	Sig. (2-tailed)	.861	.423	.666
Act_lang_4	Pearson correlation	.089	.233	.158
	Sig. (2-tailed)	.678	.273	.461
Act_lang_5	Pearson correlation	.307	.356	.342
	Sig. (2-tailed)	.144	.088	.102
Act_inv_1	Pearson correlation	-.111	-.141	-.127
	Sig. (2-tailed)	.607	.510	.553
Act_inv_2	Pearson correlation	-.023	.149	.053
	Sig. (2-tailed)	.916	.487	.807
Act_inv_3	Pearson correlation	.326	.465*	.400
	Sig. (2-tailed)	.120	.022	.052

Note. Act = actions; aud = auditory access items; lang = spoken language items; inv = involvement in intervention. * $p < .05$, two-tailed. ** $p < .001$, two-tailed.

Confidence

Parents reported slightly higher levels of confidence about promoting auditory access compared to facilitating spoken language development. Average scores were higher than scores in Ambrose et al. (2020) and within a narrower range. The highest levels of confidence were related to determining if their child's hearing device(s) are working okay and putting and keeping child's hearing device(s) on. The lowest levels of confidence were about "helping my child hear by making change in his/her environment" and "helping them hear and understand new speech sounds or sounds in their environment." Comparable with Ambrose et al. (2020), which found that knowledge and confidence were strongly correlated, parents' confidence was higher (albeit slightly) in managing their child's devices compared to supporting their language development. This is understandable as developing confidence in a task requires observation, practice, and feedback (i.e., coaching).

Actions

Out of the three subsections of the Actions section, parents reported the highest average scores related to their involvement in intervention. Parents reported higher average scores for taking actions related to facilitating spoken language development compared to auditory access. Parents perceived themselves as actively able to "get my child to the audiologist as soon as a visit is needed" and "attend and be involved" in intervention sessions. Parents most strongly agreed about their ability to act in using strategies to help their child communicate their wants and needs and sharing books at least once a day. Parents' ability

and confidence to carry out strategies that promote language development is key to FCEI practices.

Parental self-efficacy related to supporting language development Knowledge

Knowledge about supporting spoken language development in this study was highest related to "strategies the interventionist recommends using to help my child learn to communicate" and "how to help my child learn to communicate." Parents reported the least agreement about their knowledge of "the sounds, words, or sentence types that my child should be learning to say" and "communicat[ing] with my child in a way that is appropriate to address his/her hearing needs." FCEI using listening and spoken language focuses on collaborating with families to set and target clear language goals, often using parent-friendly criterion-referenced milestones such as those provided in the *Cottage Acquisition Scales for Listening, Language, & Speech*. Parents receiving such intervention might thus report being more knowledgeable in articulation, vocabulary, and syntax milestones, as well as the ways they can use facilitative language strategies to support their child's communication needs. At the same time, these milestones and strategies should be reviewed with parents throughout their time in early intervention.

Confidence

The strongest agreement among parents in terms of confidence in supporting their child's spoken language development was

related to “doing the things learned during intervention sessions when the professional is not there to help” and in helping their child learn to say new sounds, words, or sentences. Confidence was lowest related to helping their child communicate their wants and needs and communicating with their child in a way that is “appropriate to address their hearing needs,” indicating a need for increasing parents’ confidence in facilitating their child’s language growth. As DesJardin and Eisenberg (2007) suggest, two primary goals of FCEI programs should be to strengthen parental confidence and provide parents with knowledge about facilitative language techniques. Additionally, monitoring and evaluating language are important for identifying language goals, as well as discussing the effectiveness of the child’s current modality; exploring other communication opportunities could be helpful in facilitating the child’s capacity to communicate their wants and needs.

Parental self-efficacy and involvement in early intervention

Parents expressed a strong sense of self-efficacy related to their involvement in early intervention. They reported the strongest agreement about “attending and being involved in their child’s intervention sessions (instead of having to do other things during that time, such as prepare meals or take care of siblings)” and “getting their child to the audiologist as soon as a visit is needed.” This finding is encouraging; however, the sample comprised all mothers. Several studies have found that fathers are not as involved in early intervention as mothers and report lower levels of parental self-efficacy (Dirks & Swarkowski, 2022; Zaidman-Zait et al., 2016, 2018). Providers should actively encourage all caregivers to participate in intervention and seek ways to individualize engagement.

The lowest agreement was related to being able to advocate for their child’s needs in intervention sessions and Individualized Education Programs/Individualized Family Service Plans. This finding is consistent with results from previous studies (Reed et al., 2023) that have examined parent perspectives of early intervention. Parents of children who are DHH oftentimes desire to better advocate for their child’s needs and struggle to find the tools to do so (Reed et al., 2023). Connecting parents to family-based organizations and supporting the development of advocacy programs can provide them with the knowledge and support to effectively advocate for their children.

Relationship between parental self-efficacy and language development

The primary aim of the current study was to examine the relationship between parental self-efficacy specific to facilitating auditory access and spoken language development and language outcomes. Interestingly, we did not find statistically significant correlations between aspects of parental self-efficacy (i.e., knowledge, confidence, and actions) and children’s language scores (i.e., auditory comprehension, expressive communication, and total language). These findings diverge somewhat from Ambrose et al. (2020), which reported a positive correlation between the SPISE-R Confidence section and child language outcomes. This divergence might be attributed to the more general nature of the communication scale in the DP-3 used in Ambrose et al. (2020) compared to the PLS-5, leading to less distinct language scores compared to PLS-5 scores. The current study expands on the work of Ambrose and colleagues by using a more robust measure of language (i.e., PLS-5); the PLS-5 includes distinct measures of receptive and expressive language skills and relies on direct observation rather than parent report as is the case with the DP-3.

Our item-by-item analysis revealed that the strength of one parent belief was positively correlated with better receptive and expressive language skills; the belief that families can positively affect their child’s development (delays are not inevitable). This finding is consistent with Ambrose et al. (2020), highlighting the importance of providers and others (i.e., diagnosing audiologists, speech-language pathologists, teachers of the deaf, other families, and DHH adults) emphasizing with families the positive impact they can have on their child’s development. Two action items also positively correlated with expressive language. Children whose parents perceive themselves as able to implement strategies that will help their child communicate their wants and needs performed better expressively compared to children whose parents reported lower self-efficacy in this area.

The second action item positively correlated with better expressive language skills was related to involvement in intervention. Attending and being involved in intervention sessions (instead of having to do other things during that time, such as prepare meals or take care of siblings) was related to better expressive language skills, a result that aligns with findings from over two decades of research on parental involvement in FCEI (e.g., Moeller et al., 2013; van der Zee & Dirks, 2022). While more research is needed to clarify how components of parent involvement in FCEI (e.g., deciding IFSP goals and services) (Davenport et al., 2021), our findings suggest that facilitating parents’ sense of confidence in supporting their child’s language needs is essential for them to be able to put strategies into action.

Limitations and future directions

Several limitations should be considered when interpreting the current findings. First, generalizability is limited due to the homogeneity of the sample (i.e., White, middle- to upper-income, college educated). As in previous parental self-efficacy studies with parents of DHH children, our sample does not reflect the families served by providers and clinicians (racially, culturally, and linguistically diverse, widely variable household income levels). Although the literature indicates that certain cultural and contextual factors (e.g., social support, family functioning) explain differences in parental self-efficacy among parents of typically hearing children, findings on similarities and differences based on race and ethnicity are divergent (Shumow & Lomax, 2002). It is possible that the race and socioeconomic characteristics of our sample predisposed the parents toward higher general self-efficacy in parenting, which may then have skewed findings of parental self-efficacy related specifically to parenting a DHH child. Further research is needed to understand the relationship between parental self-efficacy in parents of children who are from diverse cultures and contexts.

Second, while the PLS-5 is a more robust measure of receptive and expressive language than the parent-reported measure of communication used in Ambrose et al.’s (2020) original SPISE-R study, it may not have been sensitive enough to identify individual differences in specific areas of spoken language and vocabulary development (e.g., syntax, morphology, phonological awareness). At a mean chronological age of 33.74, most of our participants were not yet eligible for most standardized language assessments for preschoolers. Future research might incorporate more specific measures, particularly for participants who are older than those in this study.

Third, the directionality between parental self-efficacy and children’s language abilities is unclear. Do better language skills in DHH children positively affect parents’ perceptions of self-efficacy, or does higher parental self-efficacy positively affect

children's language abilities? Desjardin and Eisenberg (2007) posit that mothers might adjust the language they use with their child based on the child's language abilities. Mothers whose children demonstrate more advanced language skills may use longer utterances and employ higher-level facilitative language strategies. The mode(s) of communication used by parents and children may also influence this relationship. The present study included families who had chosen listening and spoken language in English as their primary modality, though five children were reported to be exposed to American Sign Language to some degree. The quantity and quality of this signed input was not measured in this study, though future research might consider the effect of sign language usage on parental self-efficacy and language development (both spoken and signed). The current study analyzed data from one point in time using correlational methods. Without longitudinal data or experimental manipulation of variables, we cannot make claims about causation. Future studies should include longitudinal analysis of parental self-efficacy to determine if and how parental self-efficacy levels change over time, and whether parental self-efficacy functions as a mediator between children's language skills and potential predictors of parental self-efficacy (e.g., social support, parent knowledge of child development).

Implications for practice

For parents of DHH children to acquire a sense of self-efficacy, providers must communicate the value of their involvement in early intervention and the positive impact they can have on their child's language development. In our study, parents who more strongly agreed that they could attend and be involved in their child's intervention sessions, instead of having to attend to other responsibilities, were more likely to have children with higher expressive communication skills. This points to the need for intervention to be truly family centered beyond simply taking place in the family's home or requiring a parent to be present. Such intervention might address the cognitive load shouldered by parents, particularly mothers, by including creative strategies for childcare for siblings, wraparound supports for food and housing, and other ways to facilitate parents' full participation in FCEI sessions.

Parents' sense of self-efficacy in using strategies to help their child communicate their wants and needs was related to children's expressive communication and total language scores. Considering the likely bidirectional nature of this relationship, providers should consider two forms of focused feedback: one focused on parent actions and one focused on children's expressive communicative attempts. To demonstrate parental self-efficacy, parents need both knowledge of facilitative language strategies—which are already covered in many DHH-specific FCEI programs—and, critically, the belief that they can implement those strategies effectively. They, thus, require specific, personalized feedback on the ways that providers observe them expanding their child's utterances, using acoustic highlighting to draw attention to target words and sounds, and employing other strategies in everyday conversation. Parents may use strategies, such as auditory bombardment (i.e., intentional repetition of a target word or sound) and auditory sandwich (i.e., providing a visual support between two auditory-only presentations of a word or phrase) nearly unconsciously without being able to name them. Providers who carefully observe parent-child interactions and specifically highlight instances in which parents used strategies effectively may facilitate parents' development of self-efficacy. PSE also relies on parents' perception that their efforts are leading to improvements in their child's communication skills. For

children who are DHH, these improvements may be incremental and may take subtler forms than formal spoken language. Parents whose providers specifically point out the ways in which children respond, whether with words, vocal approximations, signs, gestures, or facial expressions, may develop greater sensitivity to their child's communication and higher estimations of their child's abilities. These may lead to great confidence in their ability to support communication, higher expectations, greater parental self-efficacy, and, ultimately, improvements in children's spoken language abilities.

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