

Interventions for Multilingual Children With Hearing Loss

A Scoping Review

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The aim of this article was to (1) provide a scoping review of the literature addressing speech, auditory, language, and literacy interventions in multilingual children with hearing loss, and (2) identify future research directions. The search conducted for this scoping review yielded a total of 27 sources describing 58 intervention approaches for a range of grade levels (from preschool age through school age). The majority of interventions were obtained from sources describing children with hearing loss ($n = 35$), followed by multilingual children ($n = 32$), multilingual children with additional needs ($n = 22$), and finally multilingual children with hearing loss ($n = 17$). The scope of the interventions identified and the strength of intervention recommendations are discussed. This scoping review identified a number of compelling and promising research-based interventions from the best available evidence currently available, and this review confirmed the need for more intervention studies with multilingual children with hearing loss. **Key words:** *bilingual, deaf, dual language learner, English language learner, hard of hearing, hearing loss, intervention, language, literacy, multilingual, speech*

CURRENT estimates suggest that more than 7,900 languages are used around the world and more than half of the world's population is multilingual (Grosjean, 2013; Lewis, Simons, & Fennig, 2016). Furthermore, this figure is on the rise due to factors such as immigration and easier international communication, travel, and trade (Grosjean, 2013; Javier, 2007; Leikin, Schwartz, & Tobin, 2012). The increasing number of linguistically diverse children participating in education and intervention programs means that identifying and supporting their unique needs

are issues at the forefront for many professionals working in intervention and education settings (Levin & Shohamy, 2012). By way of example, in the United States it is projected that by 2030 the proportion of children enrolled in formal education who do not use English as their first language will rise to 40% (Crawford, 2013). How best to support such children to develop speech, language, and literacy is an issue of ongoing debate that has received much attention.

Within this article, we adopt a definition of multilingualism that embraces the full scope of people who use more than one language. This definition states broadly that

People who are multilingual, including children acquiring more than one language, are able to comprehend and/or produce two or more languages in oral, manual, or written form with at least a basic level of functional proficiency or use, regardless of the age at which the languages were learned (International Expert Panel on Multilingual Children's Speech, 2012, p. 1).

Multilingual children's language acquisition is shaped by child, language, and environmental factors, as it is for all children, but

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the impact of differences in these factors between children may be greater than for monolingual language learners and vary more over time (Paradis & Grüter, 2014). Examples of sources of differences include the amount of exposure to and use of each language, the combination of languages being acquired, the age at which acquisition of each language begins, and the purpose for which each language is used (Paradis, Genesee, & Crago, 2011). These factors, among others, add to the variation seen in multilingual compared with monolingual language acquisition (Paradis & Grüter, 2014).

Language development in multilingual children has been shrouded in myths, many of which shape the way language acquisition is viewed and managed for these children. One commonality across myths is that multilingualism has negative consequences for language acquisition (Genesee, 2015; Guiberson, 2013a). In fact, many multilingual children are mistakenly considered to have communication impairments, and it is often recommended for those in their environments to use only one language as a remedy to this situation (Cruz-Ferreira, 2011, 2018).

Myths aside, studies have reported a range of benefits to being multilingual. These include benefits in domains such as executive functioning (Bialystok, Craik, Green, & Gollan, 2009; Dong & Li, 2015), metalinguistic awareness (Jasińska & Petitto, 2018), literacy (Kovelman, Baker, & Petitto, 2008), and protection against cognitive decline (Bak, Nissan, Allerhand, & Deary, 2014; Schweizer, Ware, Fischer, Craik, & Bialystok, 2012). However, poorer performance in some areas also has been noted (e.g., Bialystok & Feng, 2011; Lin & Johnson, 2014; McLeod, Harrison, Whiteford, & Walker, 2016). For example, Bialystok, Luk, Peets, and Yang (2010) reported significant differences in the receptive vocabulary skills of a sample of 1,738 3- to 10-year-old English monolingual ($n = 772$) and multilingual children ($n = 966$). On the contrary, whereas receptive vocabulary scores were statistically significantly lower for the multilingual children, they were in fact still performing within

the normal range. Furthermore, the vocabulary items that were not known by the multilingual children were typically those that would occur only in the home environment, not the school environment where the language being assessed was used. Generally, large-scale reviews of the outcomes of typically developing children have failed to show a negative impact of multilingualism (Hambly, Wren, McLeod, & Roulstone, 2013; McLeod et al., 2016).

The myths that surround language development in multilingual children with additional needs such as communication, motor, and/or cognitive impairments seem even more persistent than for children without additional needs. Cruz-Ferreira (2011) found that there is often bias against encouraging bilingualism for children with additional needs, even when children are exposed to more than one language in their daily lives. The rationale often used for a *one language only* recommendation stems from the belief that multilingual language input will overly tax a system that is already struggling to cope with language acquisition because of a communication, motor, or cognitive impairment. Thus, the rationale for this recommendation is that monolingual language input will simplify the process and give the child the best possible chance of developing at least one good language (Peña, 2016).

Superficially, this seems like a logical conclusion. However, these myths and recommendations about language use in multilingual children with additional needs are not supported by the growing body of evidence describing the development and outcomes of these children. Research has shown that children with a range of diagnoses have not been disadvantaged by being multilingual, including children with specific language impairment (e.g., Cheuk, Wong, & Leung, 2005), fluency disorders (e.g., Howell, Davis, & Williams, 2009), phonological disorders (e.g., Yavaş & McLeod, 2010), autism spectrum disorder (e.g., Hambly & Fombonne, 2014), hearing loss (HL) (e.g., Crowe, in press), and intellectual disabilities (e.g.,

Raining-Bird et al., 2005). In fact, a systematic review of multilingual children with neurodevelopmental disorders concluded that studies reporting disadvantages for multilingual children with additional needs were uncommon (Uljarević, Katsos, Hudry, & Gibson, 2016).

Children with HL form an extremely heterogeneous group, varying greatly in terms of their linguistic, cultural, social, cognitive, and developmental profiles (Leigh & Crowe, 2015); multilingual children with HL are an even more diverse subset of this group. Children with HL differ in their development across many areas, with outcomes usually poorer than that of their peers without HL, in areas such as speech, language, and listening skills (e.g., Ching et al., 2013; Cupples, Ching, Crowe, Day, & Seeto, 2014; Geers & Hayes, 2011; Sininger, Grimes, & Christensen, 2010), educational achievement, educational attainment, and vocation success (Dammeyer & Marschark, 2016; Garramiola-Bilbao & Rodríguez-Álvarez, 2016; Hendar & O'Neill, 2016).

Many studies have identified factors associated with differences in the outcomes of children with HL. However, consistency is lacking across studies in outcomes and even the direction of their effect (i.e., facilitator or barrier). For example, the age at which a child's HL was identified has been significantly related to later speech, language, and listening outcomes in some studies (e.g., Ching et al., 2017; Kennedy et al., 2006; Schramm, Bohnert, & Keilmann, 2010) but found to have no effect in other studies (e.g., Han et al., 2009; Nittrouer, 2008). Factors that are commonly examined to explain variance in the speech, language, and literacy outcomes of children with HL include degree of loss; amplification age; type, fitting, and use of devices; communication mode; education setting; maternal education; and cognitive ability. Again, however, the findings are highly variable, with the variance in outcomes and the factors that may explain the majority of differences in outcomes between children with HL still largely unexplained (Marschark & Knoors, 2019).

Although there has been much discussion about children with HL who are bimodal bilinguals (i.e., who use a signed language and spoken/written language), there is relatively scant literature describing multilingual children with HL who use two or more spoken languages. These children, whom we identify as multilingual children with HL, will be considered in this scoping review. Multilingual children with HL have even greater heterogeneity than either children with HL or multilingual children. The number of factors that potentially impact children's development due to multilingualism includes factors such as language choice, the language and literacy skills in each language of family members and other interlocutors, the age of exposure to each language, amount of exposure to each language, and the language/s of literacy and formal education. As the number of multilingual children increases in classrooms and clinics, so does the number of multilingual children with HL. In the United States, the Annual Survey of Deaf and Hard of Hearing Children & Youth reported that English language learners constituted 22.8% of their sample of 37,828 school-aged children with HL (Gallaudet Research Institute, 2011). In Australia, more than 25% of 3-year-old children in a prospective, population-based study of children with HL came from homes where a parent used a language other than English (Crowe, McLeod, & Ching, 2012).

Research describing the outcomes of multilingual children with HL is limited, but studies demonstrate heterogeneity in outcomes similar to results found for monolingual children with HL (Crowe, *in press*). Research that examines multilingualism as a factor that potentially impacts the speech perception, speech, language, and literacy outcomes of multilingual children with HL is even more limited. The majority of articles in our review that reported on the speech perception outcomes of multilingual children with HL found no relationship between multilingualism and children's outcomes in this domain (Deriaz, Pelizzone, & Fornos, 2014; Forli et al., 2018; Hodges, Ash, Balkany, Schloffman,

& Butts, 1999; Mueller, Chiong, Martinez, & Santos, 2004; Thomas, El-Kashlan, & Zwolan, 2008; Waltzman, McConkey Robbins, Green, & Cohen, 2003). However, multilingualism in children with HL was associated with worse speech perception skills in some studies (Nassif, Predolini, Barezzani, & Zanetti, 2012; Teschendorf, Janeschik, Bagus, Lang, & Arweiler-Harbeck, 2011) and better speech perception skills in others (Sininger et al., 2010). Neither have speech production outcomes been reported to be associated with better or worse outcomes in multilingual children with HL compared with monolingual children with HL (Bunta, Goodin-Mayeda, Procter, & Hernandez, 2016; Inglebret et al., 2017; Sininger et al., 2010; Yim, 2012).

In terms of vocabulary outcomes, multilingualism was found to have no impact in the majority of studies (Francis & Ho, 2003; Lund, Werfel, & Schuele, 2015; Thomas et al., 2008), but multilingualism was associated with poorer vocabulary outcomes in studies of children with HL (Deriaz et al., 2014; Kiese-Himmel, 2008). When examining studies on the impact of multilingualism on language outcomes (i.e., expressive and receptive skills in morphology, syntax, production, and comprehension) more broadly, the majority of studies describe multilingualism as not being associated with variation in language outcomes (Bunta & Douglas, 2013; Francis & Ho, 2003; McConkey Robbins, Green, & Waltzman, 2004; Sininger et al., 2010; Thomas et al., 2008; Waltzman et al., 2003). However, multilingual children with HL were also reported to perform better (Bunta, Douglas, et al., 2016; Guiberson, 2014) or worse (Boons et al., 2012; Deriaz et al., 2014; Forli et al., 2018; Teschendorf et al., 2011) than comparison groups in some studies of language outcomes. Finally, one study investigated phonological awareness for multilingual children with HL and reported that these children outperformed monolingual children with HL and multilingual children with typical hearing on some measures (Lund et al., 2015).

Given the heterogeneity of multilingual children with HL, the variability in these chil-

dren's outcomes, and the many factors that may impact children's outcomes, the challenges in developing an evidence base for effective interventions for this population of children are substantial. Yet, the provision of effective and evidence-based intervention for such children is of critical concern to educators, clinicians, researchers, and service providers, and there is currently a deficit of evidence-based practices available for working with these children and their families (Crowe, *in press*; Guardino & Cannon, 2016; Guiberson, 2013b). Evidence-based practice is an area of high interest for clinicians but also a daunting task for many who lack the training, time, and access to research sources (American Speech-Language-Hearing Association, 2017; Hoffman, Ireland, Hall-Mills, & Flynn, 2013).

METHOD, QUESTION, AND RESULTS

The current study

The study presented in this article is a scoping review. A scoping review involves an iterative process that aims to identify sources that may inform a research question. Potential sources are collected, examined for their relevance to the research question, and mapped according to how they relate to the key concepts underpinning the research question. The purpose of a scoping review is to examine the depth of research on a given topic; summarize research findings for clinicians; identify gaps in the research; and determine the value of a full systematic review. Scoping reviews do not complete a thorough or conclusive synthesis of evidence or provide in-depth assessment of the quality of evidence, but they can provide a preliminary map of interventions that may be of potential benefit. The scoping review process described by Arksey and O'Malley (2005) consisted of five phases: (a) identifying the research question; (b) identifying relevant studies; (c) selecting studies; (d) charting the data; and (e) collating, summarizing, and reporting the results.

The primary goal of this review was to determine what evidence currently exists to guide evidence-based practices working with multilingual children with HL. Secondary to this goal, the state of evidence guiding practice with populations sharing key characteristics with the population of multilingual children with HL was examined: typically developing multilingual children, children with HL (who use one spoken language), and multilingual children with additional needs (e.g., specific language impairment). As each phase was guided by the results of those that preceded it, the methods and results are explained in this section in tandem.

Phase 1: Identifying the research question

Given the aims of this study, the research question addressed was as follows: What is the existing research that describes interventions that may be appropriate for multilingual children with HL?

Phase 2: Identifying relevant studies

As scoping reviews involve a process that is flexible and iterative, we allowed the specific parameters and strategies to emerge during the scoping process as opposed to being identified prospectively as typically occurs in systematic reviews. Therefore, post hoc selection/exclusion criteria were applied to locate studies that were relevant to the research question. These criteria are described as they were generated through the method. Potential sources were initially identified through searching a range of electronic databases, journal articles, and accessing existing organizational networks, textbooks, reference lists, and conference proceedings.

We started by searching the evidence maps that were developed to describe and summarize the available research on specific clinical topics by the National Center for Evidence-Based Practice in Communication Disorders (N-CEP, 2018). As no evidence map existed that specifically described interventions for multilingual children with HL, we then searched for evidence maps for children with

HL and for multilingual children with additional needs. This led to two evidence maps for children with HL; “Hearing Loss Early Childhood” with 94 potential sources, and “Hearing Loss School Age” with 131 potential sources. We found no evidence maps for multilingual children with additional needs.

The second search for sources was conducted through the ASHA Search tool (American Speech-Language-Hearing Association, 2018). This incorporated a broad search that focused on interventions, with different combinations of search terms. The following source types were included in the search: journals, convention proceedings, and the ASHA Practice Portal. The initial search yielded a total of 859 potential sources.

Finally, we conducted a hand search of promising sources, including reference lists and known sources (journal articles, texts, or conference presentations) in line with typical scoping review procedures (Arksey & O’Malley, 2005). The hand search for additional sources included the following: (a) an article by the first author describing intervention for a multilingual child with HL (Guiberson, 2005); (b) a special issue of the *Journal Early Childhood Research Quarterly* titled “The Development and Early Care and Education of Dual Language Learners: Examining the State of Knowledge”; and (c) the “Report of the National Literacy Panel on Language-Minority-Children and Youth” (August & Shanahan, 2007) that contained nearly 2,000 potential sources.

Phase 3: Selecting studies

The sources provided by the N-CEP evidence maps were examined first. We began by excluding sources that did not describe treatment, speech-language intervention, or aural habilitation from the 94 potential sources from the evidence map for “Hearing Loss Early Childhood.” The remaining 16 sources were hand searched and included only if they presented external scientific evidence (e.g., evidence-based guidelines, systematic reviews) and if they explicitly focused on intervention for audition, speech,

language, and/or literacy. After this process, a total of eight sources remained. The 131 sources from the evidence map for “Hearing Loss School Age” were similarly examined. Limiting the search to sources describing treatment, speech-language intervention, and aural habilitation reduced the number

of sources to 17. Once articles that did not present external scientific evidence or describe intervention for audition, speech, language, and/or literacy were removed, 11 sources remained. Removal of sources that were duplicated from the two maps led to 15 unique sources being included (see Table 1).

Table 1. Charting of sources identified through scoping review

Scoping Stage	Citation	Source Type	Population
N-CEP	Beal-Alvarez and Cannon (2014)	Systematic review	HL
	Bowers (2016)	Systematic review	HL
	Brennan-Jones, White, and Law (2014)	Research review	HL
	Cannon and Guardino (2012)	Research review	MHL
	Fitzpatrick et al. (2016)	Systematic review	HL
	Kaipa and Danser (2016)	Systematic review	HL
	Kumar (2008)	Systematic review	HL
	Kumar, Young, and James (2009)	Research review	HL
	Luckner and Cooke (2010)	Systematic review	HL
	Luckner and Handley (2008)	Research review	HL
	Simpson et al. (2015)	Systematic review	HL
	Strassman and Schirmer (2012)	Research review	HL
	Taylor-Goh (2005)	Evidence-based guidelines	HL
	Tucci, Trussell, and Easterbrooks (2014)	Research review	HL
Wang and Williams (2014)	Research review	HL	
ASHA	Green, Garza, Hauck, Ruiz, and Siordia, (2011)	Conference presentation	M
	Gutiérrez-Clellen and Simon-Cerejido (2013)	Conference presentation	M+
	Ijalba (2010)	Conference presentation	M+
	Petersen (2014)	Conference presentation	M+
	Swanson, Hodson, and Schommer-Aikins (2005)	Journal article	M
Hand search	August and Shanahan (2007)	Edited textbook	M+
	Buyse et al. (2013)	Conference presentation	M+
	Castro, Gillanders, and Franco (2015)	Conference presentation	M
	Echevarria and Graves (2014)	Textbook	M
	Guiberson (2005)	Journal article	MHL
	Peregoy and Boyle (2009)	Edited textbook	M
Tabors (1997)	Textbook	M	

Note. ASHA = American Speech-Language-Hearing Association search tool; HL = evidence Maps for children with hearing loss; M = multilingual children; M+ = multilingual children with additional needs, for example, specific language impairment; MHL = multilingual children with hearing loss; N-CEP = National Center for Evidence-Based Practice in Communication Disorders.

The 859 sources identified through the ASHA search tool were inspected and included/excluded on the basis of the following criteria. Included sources: (a) explicitly focused on intervention for audition, speech, language, or literacy; (b) focused on multilingual children; and (c) reported data. Excluded sources: (a) primarily described “language of intervention” or “language of choice”; (b) focused on “assessment” or “dynamic assessment”; and (c) did not include data. If two or more sources contained descriptions of the same study, then sources were excluded on the following basis: journal articles were included over conference proceedings and/or practice portal resources and the most recent or most complete source was included. Three reviewers applied these criteria to all of the ASHA search tool sources and five sources were ultimately included (see Table 1).

The sources identified through the hand search were included if they (a) explicitly had an intervention focus that included audition, speech, language, or literacy, and (b) focused on multilingual children. The article by the first author met these criteria and was included. The articles from the special issue of the journal *Early Childhood Research Quarterly* were not eligible for inclusion; however, two sources were pearled, or obtained from the reference lists of these articles, that met the inclusion criteria. The near 2,000 potential sources from the Report of the National Literacy Panel on Language Minority Children and Youth (August & Shanahan, 2007) were hand searched, as were three textbooks and one journal article that met inclusion criteria. Across all search methods, a total of 27 sources were identified as eligible for inclusion in the scoping review.

Phase 4: Charting the data

The 27 included sources were charted to examine the types of sources identified and the populations they described (see Table 1). Through this process, it became clear that the majority of sources were review articles, which were conducted in either a systematic ($n = 7$) or a nonsystematic ($n = 7$) manner.

Other types of sources identified were conference presentations ($n = 6$), books ($n = 4$), journal articles describing interventions ($n = 2$), and evidence-based guidelines ($n = 1$). Upon closer inspection, it was revealed that several of these studies did not find benefits for interventions applied or the review yielded no studies or evidence to support a given intervention, and thus such interventions were not included in subsequent summarizing or mapping analysis (Beal-Alvarez & Cannon, 2014; Brennan-Jones et al., 2014; Fitzpatrick et al., 2016; Kumar et al., 2009; Simpson et al., 2015; Wang & Williams, 2014).

Twenty-one sources remained. In terms of the populations described, the remaining sources described children with HL ($n = 8$), followed by multilingual children ($n = 6$), multilingual children with additional needs ($n = 5$), and two articles that described interventions for multilingual children with HL ($n = 2$). Although the lack of sources describing interventions for multilingual children with HL is not surprising given the expressed need for information about this population in the literature (e.g., Cannon, Guardino, & Galimore, 2016), the fact that only two sources were identified given the large number of children in this population who are receiving intervention is of great concern.

Phase 5: Collating, summarizing, and reporting results

It is important to remember that several of the initial sources generated from the N-CEP search did not find benefits for interventions applied or the review yielded no studies or evidence to support a given intervention. As a result, and because no other sources in this review reported on these interventions, some interventions were not presented in this scoping review, including computer or technology-based interventions and interventions that employed speaking and signing concurrently. From our final scoping review, 21 sources described 58 specific interventions.

Although the interventions were described, they were often not given identifiable names, or variations of names were used, making

comparisons difficult. In charting the information from studies, therefore, we applied a thematic framework to categorize the intervention strategies described. This involved sorting interventions into the targeted domains of development (audition, speech, language, literacy) and sorting the sources into categories by the groups of children that they described: multilingual children with HL, children with HL, multilingual children, and multilingual children with additional needs. This information is presented in Figure 1, in which interventions are organized by the domain they address and ordered within domain by the frequency with which they were identified across sources. Grade level (e.g., preschool and/or school age) is also reported for each intervention.

In addition, Figure 1 presents the *strength* of each intervention recommendation, based on the greatest strength of finding in any of the sources included that described a given intervention. We coded the strength of an intervention recommendation as either *compelling*, *promising*, or *lacking*. Compelling was used for interventions that were described in a research article that isolated the intervention variable, included pretest posttest measures, and reported positive intervention outcomes. Promising was used for interventions that were described in a research article with suggestive findings, or for studies that included limited data related to intervention, and/or that did not report enough detail to be compelling. Lacking was used for interventions described in a conference presentation, textbook, or practice resource; these resources either lacked methodological details (data, procedures, other) or they were clinical/pedagogical tutorials with no substantive research-based findings reported.

Audition, speech, and language

Two interventions were identified that incorporated multiple domains (audition, speech, and language). These were auditory verbal therapy (Bowers, 2016; Kaipa & Danser, 2016) and development of speech perception (Guiberson, 2005; Taylor-Goh,

2005). These interventions were described in one source describing multilingual children with HL and three sources describing children with HL. One intervention, auditory training, was identified that targeted audition and this intervention was described in two sources, one describing multilingual children with HL (Guiberson, 2005) and one describing monolingual children with HL (Luckner & Cooke, 2010). Three interventions targeted speech production and all were described in the same two sources, one describing multilingual children with HL and one describing monolingual children with HL. The three interventions targeted speech intelligibility, phonological patterns, and segmental/suprasegmental features (Guiberson, 2005; Taylor-Goh, 2005). Of the audition, speech and language (multiple domain) interventions, auditory verbal therapy had compelling strength as a recommended practice, and speech perception, auditory training, addressing speech (phonological patterns, segmental suprasegmental, speech intelligibility) had promising strength.

Language

Language was the domain that had the most interventions described, with a total of 33 sources identified. These interventions targeted discrete levels of language such as semantics (e.g., semantic/conceptual knowledge), morphology (e.g., morphological intervention), and discourse (e.g., conversation and discourse skills). Interventions also utilized different delivery methods, such as home (e.g., home program) and direct instruction (e.g., teaching inferential strategies). The interventions most frequently described across sources ($n = 9$) were enhanced vocabulary instruction and narrative or story grammar, which were described in sources for all groups of children (August & Shanahan, 2007; Buysse et al., 2013; Cannon & Guardino, 2012; Echevarria & Graves, 2014; Guiberson, 2005; Gutiérrez-Clellen & Simon-Cerejido, 2013; Ijalba, 2010; Luckner & Cooke, 2010; Peregoy & Boyle, 2009; Petersen, 2014; Tabors, 1997).

Domain	Intervention	Grade	Strength	MHL	HL	M	M+
				Cannon et al. (2012) Guiberson (2005) Bowers (2016) Kaipa & Dauser (2016) Kumar (2008) Luckner & Handley (2008) Luckner & Cooke (2010) Strassman & Schirmer (2012) Taylor-Goh (2005) Tucci et al. (2014) Castro et al. (2015) Echevarria & Graves (2014) Green et al. (2011) Perego & Boyle (2009) Swanson et al. (2005) Tabors (1997) August & Shanahan (2007) Buyse et al. (2013) Gutiérrez-Clellen & Simon-Cerejido (2013) Ijalba (2010) Petersen (2014)			
Audition, Speech, Language	Auditory verbal therapy	P,S	◆		•		
	Developing speech perception	P,S	+	•		•	
Audition	Auditory training	P,S	+	•	•		
Speech	Phonological patterns	P,S	+	•		•	
	Segmental/supra-segmental features	P,S	+	•		•	
	Speech intelligibility	P,S	+	•		•	
Language	Enhanced vocabulary instruction	P,S	+	•	•	•	• • • • • •
	Narrative or story grammar	P,S	◆	•	•	• • •	• • • • •
	Enhanced/shared storybook reading	P,S	+	• •		• •	• • • •
	Cross-linguistic referencing	P,S	+	•		• •	• • •
	Activating background knowledge	P,S	+		•	•	• • • •
	Repetitive learning experiences	P,S	~			• •	• • • •
	Modeling & prompting	P,S	+		•	•	• • •
	Parental involvement	P,S	+		•	•	• • •
	Use of visual aids	P,S	+			• •	• • •
	Conversational & discourse skills	P,S	+			•	• • •
	Graphical depiction	P,S	~			• •	• • •
	Hands on activities/learning	P,S	~			• •	• • •
	Recasts & expansions	P,S	~			•	• • •
	Teaching key words	P,S	◆		•	• •	• • •
	Contextualized teaching (here/now)	P,S	+	•		•	• • •
	Modeling & demonstrating activities	P,S	~			• •	• • •
	Social interaction	P,S	~			•	• • •
	Use of peer models and pairing	P,S	~			• •	• • •
	Communication breakdown strategies	P,S	~			•	• • •
	Early communication	P,S	~			•	• • •
	Home program for home language	S	+	•		•	• • •
	Morphological intervention	P,S	+			•	• • •

Figure 1. Preliminary map of the literature supporting specific interventions. HL = children with hearing loss; M = multilingual children; M+ = multilingual children with additional needs, for example, specific language impairment; MHL = multilingual children with hearing loss. Grade: Preschool (P), School age (S). Strength of recommendation: Compelling (◆), Promising (+), Lacking (~).

Previewing and reviewing content	S	+	•										•											
Simplified grammar or syntax	P,S	+											•										•	
Teaching frequently used words	P,S	◆									•		•											
Social rules of communication	P,S	+										•											•	
Teaching novel words	P,S	◆										•		•										
Checking for understanding	P,S	+	•																					
Explicit modifier instruction	P	+																					•	
Focused stimulation	P	+																				•		
Semantic/conceptual knowledge	P,S	◆										•												
Teaching inferential strategies	P,S	◆										•												
Wait time	P,S	~																					•	
Literacy	P,S	◆	•	•											•	•	•	•	•	•	•		•	
Phonological awareness	P,S	◆										•									•	•	•	•
Book and print concept knowledge	P,S	+												•		•	•						•	
Collaborative writing approaches	P,S	+											•		•						•			
Contextualized grammar instruction	P,S	◆												•	•							•	•	
Reading and thinking activities	P,S	◆												•		•						•		
Decoding instruction	S	◆	•																				•	
Explicit comprehension instruction	P,S	+												•										
Increased interaction (groups)	P,S	+																				•	•	
Summarizing ideas and concepts	S	+																					•	
Teaching orthographic rules	S	◆																					•	
Use of high-interest text	P,S	+																					•	
Use of writing support tools	P,S	+																					•	
Clarify difficult words and passages	S	+																					•	
Dialogue journals/experiential writing	S	+	•																					
Five paragraph essay	S	+																					•	
Introducing book with a picture walk	P	+																					•	
Providing written outlines	S	+	•																					
Writers workshop, writing process	S	+																					•	

Figure 1. (Continued)

Of the language interventions, six had compelling strength (narrative or story grammar, teaching key words, teaching frequently used words, teaching novel words, semantic/conceptual knowledge, and teaching inferential strategies), 17 had promising strength, and 10 were rated as lacking strength. Of the intervention strategies that were promising, the following strategies were described in four or more sources: enhanced vocabulary instruction, enhanced/shared storybook reading, cross-linguistic referencing, activating background knowledge, repetitive learning experiences, modeling and prompting, parental involvement, use of visual aids, and conversational or discourse skills.

Literacy

The final domain of language described was literacy, which included descriptions of 19 interventions. Interventions focused on a number of literacy skills, including phonology (e.g., phonological awareness), reading decoding (e.g., decoding instruction), comprehension (e.g., summarizing ideas and concepts), global aspects of literacy, reading material (e.g., use of high-interest texts), and writing strategies (e.g., collaborative writing). Six of the literacy strategies had compelling strength (phonics/spelling with visuals, phonological awareness, contextualized grammar instruction, reading and thinking activities, decoding instruction, teaching orthographic rules) and 13 had promising strength. Book and print concept knowledge and collaborative writing approaches were promising strategies that were described in four or more sources.

DISCUSSION

This scoping review revealed a number of important findings relating to evidence-based interventions targeting audition, speech, and language for multilingual children with HL. Because of the lack of intervention research available describing multilingual children with HL, we expanded the search of studies

to include children who had one of these factors but not both.

As clinicians, we must integrate information and act in accordance with the best *available* evidence. In many instances, that may include drawing upon related bodies of research to identify promising intervention approaches. Based on our scoping review of resources describing interventions with multilingual children with HL, children with HL, typically developing multilingual children, and those with additional needs, we found several interventions to be compelling. Compelling interventions included auditory verbal therapy, narrative or story grammar, interventions that explicitly focus on vocabulary, inferential strategies, phonics/spelling with visuals, phonological awareness, contextualized grammar instruction, reading and thinking activities, reading decoding instruction, and teaching orthographic rules. Although intervention planning must be highly individualized, these interventions may assist in addressing the needs of multilingual children with HL.

We also found 35 intervention strategies that the evidence showed as promising, many of which are familiar ingredients to interventions that clinicians may already be employing with children with HL or other children with speech, language, and learning needs. The use of these interventions may be promising, but they should be evaluated for effectiveness on a case-by-case basis until additional research can substantiate their use with multilingual children with HL.

Finally, we found that 10 of the interventions we reviewed lacked adequate strength to confidently recommend their use. Clinicians should proceed with caution in the use of these interventions with multilingual children with HL. Even if the intervention is familiar, the clinician should continue to look for evidence that supports its use with this population.

It was striking to find that there is currently very little intervention research available describing multilingual children with HL. The lack of evidence relating to this

population is both a limitation to this study and a concern for several reasons. One of these is that high-quality research-based interventions are needed for this population, especially given the higher risk of academic failure that has been reported for children from linguistically diverse backgrounds (August & Shanahan, 2007) and children with HL (see Marschark, 2018) compared with their peers. In addition to this, the number of multilingual children with HL is on the rise (Leigh & Crowe, 2015), making the need for efficient and effective intervention practices with these children even more pressing.

Because of the lack of available research on intervention approaches with multilingual children with HL, the inclusion of typically developing multilingual children became an important feature of this scoping review. Interventions for multilingual children were developed specifically to address the learning needs of culturally and linguistically diverse children. Adding this search parameter resulted in considering a number of interventions that were not described in the literature concerning children with HL. It has clearly been established that multilingual children, including typically developing children, children with HL, and children with communication impairments are capable of becoming bilingual to the best of their ability (Bialystok et al., 2010; Guiberson, 2013b; Raining-Bird et al., 2005).

However, caution needs to be applied in the application of interventions found to be effective for children without HL and for children with HL, as differences in these groups of children may alter the effect of the intervention. Another important consideration is the need for culturally consistent interventions for children and families from diverse backgrounds, as cultural differences may render some interventions inappropriate, foreign, or in conflict with cultural beliefs and parenting practices for some families and children. Interventions that are tailored specifically to the unique learning needs of multilingual children with HL need to be developed and evaluated for effectiveness.

Through our scoping review, we found that a majority of sources in the literature describing interventions for multilingual children focused on choices about the language of intervention (e.g., intervention in Spanish vs English) rather than specific intervention strategies (e.g., shared storybook reading, or phonic instruction approaches). Given that there is ample research documenting the many aspects of choices about language of intervention decisions and the impact of different choices in this regard, it is time for researchers to shift their focus to other aspects of intervention with these children. This is most important for multilingual children with HL due to the profound lack of evidence documenting intervention strategies.

Finally, the scope of literature considered in this review provides a preliminary map of interventions that are of potential benefit to multilingual children with HL. Looking across the literature on children with HL and multilingual children who are typically developing or have an additional need, 58 potential interventions were identified that span developmental levels, language backgrounds, and domains. Detailed information on these interventions is presented in Figure 1. Clinicians will find that many of these interventions are familiar and common ingredients or strategies that are included in intervention approaches. What is now critically needed is a systematic review that evaluates the quality and evidence that can be obtained from intervention studies of children with HL and multilingual children, as well as the related populations described in this scoping review. Identifying this evidence is a needed step toward implementing evidence-based strategies with this population. As eloquently stated by Spencer and Marschark (2010):

Our job as professionals who care about these students is to continue to look past what we used to think we knew, consider the great body of information available, and use that to develop ever stronger supports that will allow all children to reach their potential (p. 193).

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