

Review Article

Identifying Relevant Concepts for the Development of a Communicative Participation Item Bank for Children and Adolescents: A Systematic Review of Existing Instruments

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ABSTRACT

Purpose: This study aims to systematically identify items that measure communicative participation from measurement instruments that measure (aspects of) communication and/or participation in children and adolescents (5–18 years old) with communication disorders, for developing an item bank.

Method: A systematic literature search was performed in MEDLINE and Embase to search for patient-reported outcome measures (PROMs) or parent reports measuring aspects of communication and/or participation in children and adolescents. The individual items of the included measurement instruments were reviewed on whether they measure communicative participation. The items were then classified into one of the International Classification of Functioning, Disability and Health (ICF) for Children and Youth (World Health Organization, 2007) domains of activities and participation.

Results: A total of 29 instruments were found, nine PROMs and 20 parent reports. One hundred forty-five items were identified that measure communicative participation. From these 145 items, 74 were retrieved from PROMs (51%), and 71 were retrieved from parent reports (49%). The majority of items were classified in ICF Domain 7, interpersonal interactions and relationships (73.8%), followed by Domain 8, major life areas (13.8%), and Domain 9, community, social, and civic life (8.3%). Only a few items were found in Domains 5 and 6, and none was found in Domains 1, 2, and 4.

Conclusions: We identified 145 items potentially useful for developing an item bank addressing communicative participation in children and adolescents with communication disorders. However, item development in collaboration with the target population is needed to ensure that these items fully reflect the construct.

Speech and language therapists (SLTs) are the primary care professionals to treat people with speech, language, and voice disorders or with hearing loss (henceforward, communication disorders; American Speech-Language-Hearing Association, 2016). Improving the

participation of individuals in daily life situations that require communication is their ultimate goal. This participation in daily life situations that require communication is called *communicative participation*. Communicative participation was introduced in 2006 and is defined as “taking part in life situations where knowledge, information, ideas, or feelings are exchanged. It may take the form of speaking, listening, reading, writing, or nonverbal means of communication” (Eadie et al., 2006, p. 4). Communicative participation is the overlap between the

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two concepts of communication (exchange of knowledge, ideas, or feelings) and participation (taking part in life situations).

The construct communicative participation is embedded in the International Classification of Functioning, Disability and Health (ICF) model (Baylor et al., 2021; World Health Organization, 2001). This model describes multiple components of health, consisting of (a) body functions and structures, (b) activities and participation, and (c) contextual factors. Communicative participation is linked with the activities and participation component, which is structured into nine domains: (1) learning and applying knowledge; (2) general tasks and demands; (3) communication; (4) mobility; (5) self-care; (6) domestic life; (7) interpersonal interactions and relationships; (8) major life areas; and (9) community, social and civic life. Communicative participation concerns all participation situations that require communication within these participation domains. Communicative participation interacts with one or more of the other components of the ICF model in a multidirectional way (Baylor et al., 2021). How someone experiences communicative participation is an interaction of both severity of the communication disorder (body functions) and personal and environmental elements (contextual factors).

Over the years, communicative participation has received growing interest in speech and language therapy and is now recognized as the most important goal of therapy in people with communication disorders (Baylor & Darling-White, 2020; Torrence et al., 2016). This is reflected in the participation-focused framework proposed by Baylor and Darling-White (2020), in which the elements of the ICF model have been reorganized to aid clinical practice and help clinicians provide more person-centered care. In this framework, communicative participation is at the center as the primary focus and central organizing principle of treatment planning, and other elements of the ICF model are placed around it. This model reflects the importance of the construct of communicative participation and underlines the necessity of being able to capture this outcome by means of a measurement instrument.

For the adult population, the Communicative Participation Item Bank (CPIB) was developed to measure communicative participation from the patient's perspective (Baylor et al., 2013). The CPIB is a patient-reported outcome measure (PROM) based on the principles of an item bank. An item bank is a collection of a large number of questions, all addressing one construct (de Ayala, 2022). The characteristics of the items in the item bank (difficulty and discrimination) are determined by item response theory (IRT) analysis. Because the CPIB is based on IRT, it provides several opportunities in administering the CPIB as a PROM: as a whole, as a short form, or as a

computer adaptive test, in which the computer determines based on the previous answer which follow-up question is asked. The CPIB can be used in individual patient care as a diagnostic tool, or an evaluation instrument, and to facilitate shared decision making on relevant participation-focused treatment goals (Baylor & Darling-White, 2020).

For children and adolescents with communication disorders, no PROMs are available to measure communicative participation (Darling-White, 2017). Cunningham et al. (2017) performed a scoping review on measures to evaluate speech and language outcomes for preschoolers with communication disorders, to gain a more thorough understanding of methods for measuring communication disorders. They placed the outcomes within the ICF model for children and youth (ICF-CY; World Health Organization, 2007) to determine whether they captured the body functions, activities, or participation component. They found that only 15% of measures address the participation domain of the ICF (Cunningham et al., 2017). Furthermore, all instruments are reported by either the clinician or parent and therefore do not allow for the child to independently report on their own perceived communication.

Although it may seem more practical to obtain proxy results via parents, it is vital to include the child's own perspective on communicative participation. Self-report in children should be enabled whenever possible, as a child has a unique vision of own experiences (Coombes et al., 2021; Riley, 2004). How a child experiences health often differs from the parent's view (Khadka et al., 2019). The discordant outcomes between parents and children may be due to several reasons. First, agreement between self-report and parent report differs for observable and unobservable outcomes (Kwon et al., 2022). For observable outcomes, the agreement between parents and children seems to be higher than for nonobservable outcomes. The construct communicative participation contains both observable and unobservable aspects, of which only a child is able to provide a reliable view. Second, the well-being of the parent may influence the extent to which a parent questionnaire is completed. Their views on the child's health may be influenced by the burden of care or their own mental health (Eiser & Morse, 2001). Although both perspectives have their own value, the use of PROMs in the field of speech and language therapy is not yet standard care (Cohen & Hula, 2020), although it is assumed that children as young as 5 years old are capable of reporting on their own health, especially when an age-appropriate instrument is used (Varni et al., 2007).

In summary, we know that communicative participation is the most important outcome of speech and language therapy, but SLTs are unable to evaluate therapy on this aspect with children and adolescents. Taking the

child's perspective is important to be able to provide adequate and tailored care, particularly as there is often a mismatch between parents' and child's perspectives. For adults, an item bank capturing communicative participation is available (Baylor et al., 2013). This PROM provides a valuable starting point for the development of a PROM suited to children and adolescents. At the same time, the items within the current CPIB are very likely to be unsuited for this population. Communicative participation is about participation situations in which a person is required to communicate to be able to take part. It is thus about different social contexts in which the child or adolescent engages (Darling-White, 2017). Not only are social contexts likely to differ between adults and children and adolescents, but they are also likely to rapidly change as a child is developing. Questions from a measurement instrument should match a child's life context so only relevant questions are asked to the child. This requires an item bank to contain a large number of items covering social contexts matching wide ranges of developmental phases (or ages), ranging from in-class activities to going on a first date or understanding the instructions during driving lessons.

When developing an item bank, good content validity is important. This is achieved by using multiple sources of information to identify relevant content. Reviewing what is already available in the literature is an important aspect, as well as identifying content in co-creation with the target population, using qualitative research methods (De Vet et al., 2011; Mokkink et al., 2018). In this article, we perform a literature study similar to the one Eadie et al. (2006) conducted for the CPIB. This entails a literature search for PROMs on communication (in Eadie et al. among adults), and individual items were then assessed whether they were about communicative participation (Eadie et al., 2006). Recently, Ter Wal, Van Ewijk, Dijkhuis, et al. (2023) added up to the work of Eadie et al. by conducting a similar study for PROMs developed between 2006 and 2021.

Our systematic review is similar to the work of Eadie et al. (2006) and Ter Wal, Van Ewijk, Dijkhuis, et al. (2023) but for the target population of children and adolescents. It describes the first step of the development of an item bank measuring communicative participation in children and adolescents. The aim is to identify items that measure communicative participation from measurement instruments that aim to measure (aspects of) communication and/or participation in children and adolescents (5–18 years old) with communication disorders. The items were then classified into one of the ICF activities and participation domains to provide an overview of the domains the items cover and thereby what social contexts are addressed by the items. Specifically, the following research questions are addressed:

1. Which existing items that measure communicative participation can be extracted from PROMs and parent reports that measure aspects of communication or participation in children and adolescents with communication disorders?
2. What domains of the ICF activities and participation chapter do the existing items that measure communicative participation address?

Method

Search Strategy

According to the standards of the COnsensus-based Standards for the selection of health Measurement INSTRUMENTS (COSMIN) guideline for systematic reviews (Prinsen et al., 2018), a systematic search was performed in PubMed and Embase (April 20, 2022), to identify self-report instruments (PROMs) or parent reports that measure communication and/or participation in children and adolescents with speech, language, hearing, or voice disorders. The search string was created in consultation with a clinical librarian and was based on the four key elements of a systematic review on PROMs: (a) construct, (b) population, (c) type of instrument, and (d) measurement properties (Prinsen et al., 2018). The search was limited to articles published in Dutch or English. The search string for both databases can be found in Appendix A.

In addition to the search in Embase and PubMed, we searched for relevant instruments in the following databases: "Measurement Instruments in Healthcare" (Zuyd University of Applied Sciences, 2022) and the Patient-Reported Outcome and Quality of Life Instruments Database (PROQOLID) database (Mapi Research Trust, 2023). These databases aim to describe measurement instruments (and, in case of the PROQOLID, specifically PROMs) and information about development and characteristics of the measurement instruments, and they served as an additional source for relevant instruments. The authors decided not to consult other sources.

Selection Criteria

The following selection criteria were formulated. The first four criteria are in line with the four key elements of the guideline for systematic review on PROMs (Prinsen et al., 2018): (a) The described instrument measures communication or participation in its broadest interpretation—an example of this are instruments that aim to measure the impact of communication difficulties on quality of life or on daily life; (b) the study population consisted of children and adolescents (5–18 years old) with speech, language, hearing, or voice disorders; (c) the

instrument was a self-reported instrument or a parent report; and (d) there was at least some information available on the measurement properties of the instrument. A fifth criterion was added because of practical reasons considering language: The article and the described instrument were available in English or Dutch. A sixth criterion was that all research designs were included, except for reviews.

Screening Abstracts and Articles

Titles and abstracts were screened for the eligibility criteria. The selection of abstracts was performed in Rayyan Systems Inc. (Ouzzani et al., 2016). Full-text articles of all selected abstracts were obtained. They were read and included according to the same selection criteria as the screening of the abstracts. Two authors (E.A. and L.B.; both SLTs with a master in health sciences) independently performed the selection of abstracts and full-text articles. Differences between the two authors were discussed until consensus was reached. When in doubt, the differences were discussed with two additional authors (L.v.E. and M.L.; both senior researchers).

Selection and Retrieval of Measurement Instruments

Based on the included articles, names of the described instruments were obtained and duplicates were removed. Full English or Dutch versions of the instruments were searched for in the literature or were requested from the author.

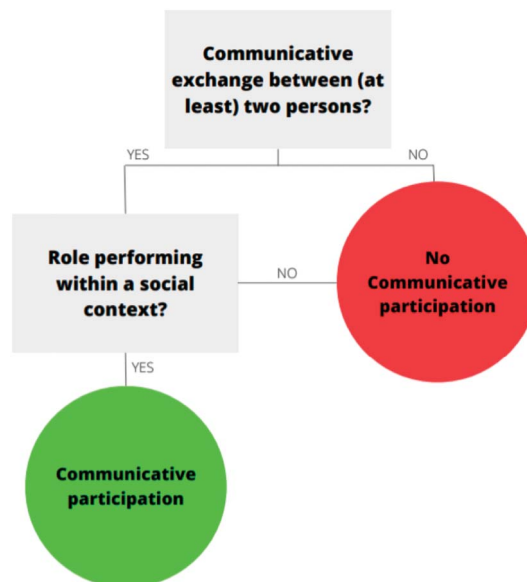
Risk of Bias

Risk of bias of the included studies was not assessed because this was not relevant for the aim of this study, as we were not interested in the quality (reliability and validity) of the included instruments. In this study, we aimed to identify existing items that measure communicative participation from PROMs and parent reports. The critical appraisal consisted of reviewing the individual items based on criteria for communicative participation. The identified items form an initial item pool of an item bank measuring communicative participation, which we will complement with items from a concept elicitation study with the target population. Items will undergo extensive testing on the quality aspects comprehensibility, relevance, and comprehensiveness in future studies, following the guidelines of the COSMIN initiative (De Vet et al., 2011; Mokkink et al., 2018).

Data Extraction and Rating Results: Item Review

From the included measurement instruments, all items measuring communication or participation were extracted and entered into Microsoft Excel. E.A. and L.B. independently assessed whether the items measured communicative participation, using the decision support tool presented in Figure 1. Differences between authors E.A. and L.B. were discussed until consensus was reached. When in doubt, the differences were discussed with two additional authors (L.v.E. and M.L.).

Figure 1. Decision support tool item review. This figure shows the two-step decision in deciding whether or not an item measures communicative participation.



To meet the criterion of “communicative exchange,” the item should describe an interaction between (at least) two communicative partners. The communication partner needs to be a natural person who communicates either directly in the here and now or over a prolonged period and physical distance (e.g., texting a friend, e-mailing a teacher). The message could be either verbal, nonverbal, or graphical.

To meet the criterion of “participation,” the item should reflect performing a social role within a social context. The social role could be included either by mentioning a communicative partner (e.g., communicating with my parents; role of a child) or by mentioning a specific location (e.g., communicating in the classroom; role of a student).

Data Synthesis: Classification of Items Measuring Communicative Participation

The items selected to measure communicative participation were classified based on the ICF-CY activities and participation component. Eight domains of this component served as classification categories: (1) learning and applying knowledge; (2) general tasks and demands; (4) mobility; (5) self-care; (6) domestic life; (7) interpersonal interactions and relationships; (8) major life areas; and (9) community, social and civic life. Notice that Domain 3, communication, was not used as a classification category, because this domain is about general communication and does not describe communication within a participation situation. E.A. and L.B. independently classified all included items. When in doubt, differences were discussed with two additional authors (L.v.E. and M.L.).

Results

Screening Abstracts and Articles

In total, 5,557 unique abstracts were reviewed, of which 108 abstracts were included for full-text screening. Of these, 41 were excluded because the described instrument did not meet the inclusion criteria.

Selection and Retrieval of Measurement Instruments

Finally, 67 articles were included, which described 31 unique instruments. Of these 31 instruments, four instruments were excluded. One was excluded because it described another construct. Three instruments were excluded because they could not be retrieved, even after requesting the author. These exclusions resulted in a total of 27 included instruments. However, during the retrieval process, two additional instruments were found. One

instrument already selected had two versions for different age groups. Both versions slightly differed in their questions, and it was decided to include both. During retrieval of an instrument from a large test battery, an additional instrument was found in that battery and included as it met eligibility criteria.

This resulted in a total of 29 instruments that were included for the purpose of this review. Of these, nine instruments were PROMs, and 20 were parent reports. The target age range varied per instrument. The process of screening and selecting abstracts, articles, and instruments is described in Figure 2.

Data Extraction and Rating Results: Item Review

The 29 instruments contained a total of 1,149 items. Of these items, 145 were reviewed as measuring communicative participation. Appendix B provides an overview of the included item numbers of items that were reviewed as measuring communicative participation.

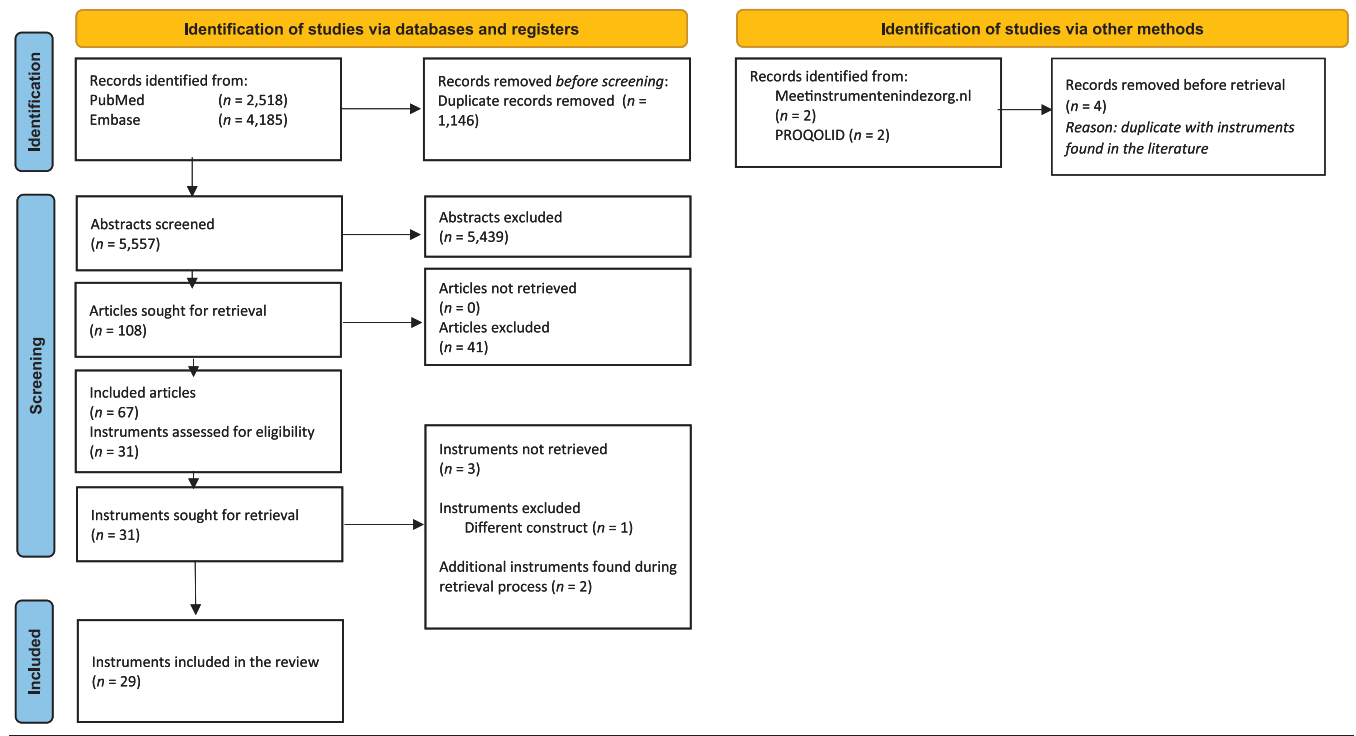
From the 145 items that measure communicative participation, 74 were retrieved from PROMs (51%) and 71 were retrieved from parent reports (49%). There were no PROMs or parent reports where all items measured communicative participation.

The instruments that contained the highest percentage of communicative participation items were the Behavior Assessment Battery–Speech Situation Checklist (BAB-SSC; 28/55 items, 50.9%), developed for children between 7 and 14 years old who stutter; the Speech, Spatial and Qualities of Hearing Scale (SSQ; 10/27, 37%), developed for children between 11 and 18 years old with hearing loss; and the Focus on the Outcome of Communication Under Six (FOCUS; 18/50, 36%), a parent report for children between 1;5 (years;months) and 6 years old with developmental language disorder. An overview of all 29 identified instruments, their target population, measured construct, and the percentage of items measuring communicative participation is presented in Table 1.

Data Synthesis: Classification of Items Measuring Communicative Participation

Items were then classified into the ICF-CY domains of activities and participation. Most of the items fell in Domain 7, interpersonal interactions and relationships (107/145, 73.8%), followed by Domain 8, major life areas (20/145, 13.8%), and Domain 9, community, social and civic life (12/145, 8.3%). Only few items were classified within Domain 5, self-care (4/145, 2.8%), and Domain 6, domestic life (2/145, 1.3%). No items were classified in

Figure 2. Flowchart. PROQOLID = Patient-Reported Outcome and Quality of Life Instruments Database.



Domain 1, learning and applying knowledge; Domain 2, general tasks and demands; and Domain 4, mobility. Table 2 provides examples of items within each ICF domain.

Overview of Items per Target Age

The included instruments were not all developed and validated for the entire target population (5–18 years old). As presented in Table 2, each instrument has its own target age range. As a result, not all 145 items may be suited to the entire range of children between 5 and 18 years old. A different number of relevant items was found for each age. Figure 3 presents an overview of the available number of items measuring communicative participation per target age, divided into the number of PROM items and parent report items.

Discussion

This systematic review aimed to identify items that measure communicative participation from PROMs and parent reports that measure communication and/or participation in children and adolescents (5–18 years old) with communication disorders. The items were linked to the ICF-CY domains of activities and participation. A total

of 29 instruments were found: nine PROMs and 20 parent reports. From these instruments, 145 items were reviewed as measuring communicative participation. The majority of these items were placed in ICF Domain 7, interpersonal interactions and relationships (73.8%), followed by Domain 8, major life area (13.8%), and Domain 9, community, social and civic life (8.3%). Only a few items were found in Domains 5 and 6, and none was found in Domains 1, 2, and 4.

Child-Reported Communicative Participation

The first research question is about the search for both PROMs and parent reports. Results show how many PROMs and parent reports were found and how many items we selected from each type of instrument. Roughly half of the items that were selected in the critical appraisal process originated from PROMs; and the other half, from parent reports. In terms of the overall number of instruments, however, we found that the majority of instruments identified were parent reported (20 out of 29). For the youngest age groups (5 and 6 years), items were exclusively retrieved from parent-reported instruments. Although it is challenging to define an exact age at which children can self-report, it has been suggested that children from the age of 5 years are able to do so (Varni et al., 2007). In the population of children and adolescents with communication

Table 1. Overview of included instruments.

Instrument	Type of instrument	Author instrument	Target population	Construct	No. of items classified as measuring communicative participation	ICF domain							
						1 ^a	2 ^b	4 ^c	5 ^d	6 ^e	7 ^f	8 ^g	9 ^h
Behavior Assessment Battery–Speech Situation Checklist	PROM	Brutten & Vanryckeghem (2007)	Children 7–14 years old: stuttering	Speech-related anxiety experienced in particular speech situations	28				1	2	15	9	1
Speech, Spatial and Qualities of Hearing Scale	Parent report	Galvin & Noble (2013)	Children 11–18 years old: hearing loss	Measuring a range of hearing disabilities across several domains	10						10		
Focus on the Outcome of Communication Under Six	Parent report	Thomas-Stonell et al. (2010)	Children 1;5 (years; months) to 6 years old: developmental language disorder	Ability to communicate and participate in the child's community	18						18		
Caregiver Report of Behaviors & Events	Parent report	Patrick et al. (2018)	Children 5–10 years old: hearing loss	Communication and social behaviors/ events	7						7		
Communication Profile–Adapted	Parent report	Bunning et al. (2014)	Children 2–9 years old: using AAC	Caregivers' perceptions of their child's abilities and activities for communication and participation in family and community events	6				1		5		
Overall Assessment of the Speaker's Experience of Stuttering for School-Age Children (ages 7–12)	PROM	Yaruss & Quesal (2006)	Children 7–12 years old: stuttering	Experience of stuttering	15						8	4	3
Youth Quality of Life Instrument–Deaf and Hard of Hearing Module	PROM	Patrick, Edwards, et al. (2011)	Children 11–18 years old: hearing loss	Quality of life among adolescents with hearing loss	7						5	1	1
Functioning after Pediatric Cochlear Implantation	Parent report	Lin et al. (2007)	Children 2–5 years old: hearing loss	Communicative performance scale for the evaluation of real-world verbal communicative performance	5						5		

(table continues)

Table 1. (Continued).

Instrument	Type of instrument	Author instrument	Target population	Construct	No. of items classified as measuring communicative participation	ICF domain							
						1 ^a	2 ^b	4 ^c	5 ^d	6 ^e	7 ^f	8 ^g	9 ^h
Overall Assessment of the Speaker's Experience of Stuttering for School-Age Children (ages 13–17)	PROM	Yaruss & Quesal (2006)	Children 13–17 years old: stuttering	Experience of stuttering	16						5	4	7
Auditory Behavior in Everyday Life	Parent report	Purdy et al. (2002)	Children 4–14 years old: hearing loss	Parental perception of their children's auditory behavior/abilities/performance in everyday life	4						4		
VELO instrument	PROM	Skirko et al. (2012)	Children 5–17 years old: velopharyngeal insufficiency	Concerns that matter most to patients with velopharyngeal insufficiency and their parents	3						3		
Behavior Assessment Battery–Communication Attitude Test	PROM	Brutten & Vanryckeghem (2007)	Children 7–14 years old: stuttering	Child's attitude about their speech	4						1	3	
Family Impact of Assistive Technology Scale for Augmentative and Alternative Communication	Parent report	Delarosa et al. (2012)	Children 3–18 years old: using AAC	Everyday functional outcomes of AAC interventions	9				2		7		
Pediatric Voice-Related Quality of Life	Parent report	Boseley et al. (2006)	Children 2–18 years old: voice disorders	Voice-related quality of life	1						1		
Pediatric Voice Handicap Index	Parent report	Zur et al. (2007)	Children 8–12 years old: voice disorders	Impact of voice disturbance on the child's well-being	2						2		
Assessment of Conversational Pragmatics	Parent report	Gentileau-Lambin et al. (2019)	Children 6–12 years old: pragmatic language impairment	Screening tool for pragmatic language impairment	2						2		

(table continues)

Table 1. (Continued).

Instrument	Type of instrument	Author instrument	Target population	Construct	No. of items classified as measuring communicative participation	ICF domain							
						1 ^a	2 ^b	4 ^c	5 ^d	6 ^e	7 ^f	8 ^g	9 ^h
Early Language Scale	Parent report	Visser-Bochane et al. (2021)	Children 1–6 years old	Screening developmental language disorder	2						2		
KIDSCREEN-27	PROM	Ravens-Sieberer et al. (2001)	Children 8–18 years old: hearing loss	Health-related quality of life Pardo-Guijarro et al. (2013) validated the instrument in deaf children; therefore, it was included.	1						1		
Children with Cochlear Implants: Parental Perspectives	Parent report	O'Neill et al. (2004)	Children 3–7 years old: hearing loss	Parental views on the effectiveness of CI	2						2		
Functional Listening Index–Paediatric	Parent report	Davis et al. (2022)	Children 0–6 years old: hearing loss	Functional listening skills	1						1		
Children's Communication Checklist	Parent report	Bishop (1998)	Children 5–17 years old: pragmatic language impairment	Assessment of pragmatic communication	1							1	
Parental perspective instrument for pediatric cochlear implantation	Parent report	Archbold et al. (2008)	Children 3–7 years old: hearing loss	Child's functioning after CI implantation	1						1		
Airway–Dyspnoea–Voice–Swallow scale	Parent report	Nouraei et al. (2017)	Children 0–16 years old: laryngotracheal stenosis	Impact of interventions on voice and swallowing functions	0								
Children's Communication Checklist-2	Parent report	Bishop (2003)	Children 4–15 years old: pragmatic language impairment	Pragmatic language impairment	0								
Generic Lifestyle Assessment Questionnaire	Parent report	Jessen et al. (2003)	Children 0–14 years old: cerebral palsy	Impact of childhood disability	0								
Parent-Proxy Preschool Hearing Environments and Reflection on Quality of Life	Parent report	Yu et al. (2021)	Children 2–6 years old: hearing loss	Quality of life among young children with hearing loss	0								

(table continues)

Table 1. (Continued).

Instrument	Type of instrument	Author instrument	Target population	Construct	No. of items classified as measuring communicative participation	ICF domain								
						1 ^a	2 ^b	4 ^c	5 ^d	6 ^e	7 ^f	8 ^g	9 ^h	
Intelligibility in Context Scale	Parent report	McLeod et al. (2012)	Children 4–5 years old: speech disorder	Parents' estimates of how well their child's speech is understood in daily life by different communication partners	0									
Children's Voice Handicap Index-10	PROM	Ricci-Maccarini et al. (2016)	Children 8–14 years old: voice disorder	Self-perception of dysphonia	0									
La Trobe Communication Questionnaire	PROM	Douglas et al. (2000)	Young adults 16–39 years old: traumatic brain injury	Perception of communicative ability	0									

Note. ICF = International Classification of Functioning, Disability and Health; PROM = patient-reported outcome measure; AAC = augmentative and alternative communication; CI = cochlear implant.

^aICF Domain 1: learning and applying knowledge. ^bICF Domain 2: general tasks and demands. ^cICF Domain 4: mobility. ^dICF Domain 5: self-care. ^eICF Domain 6: domestic life. ^fICF Domain 7: interpersonal interactions and relationships. ^gICF Domain 8: major life areas. ^hICF Domain 9: community, social and civic life.

Table 2. Examples of items per ICF activities and participation domain.

ICF domain	No. of items/total (%)	Item example
5. Self-care	4/145 (2.8)	<i>My child tells me when she/he feels sick.</i> (FIATS-AAC; Delarosa et al., 2012)
6. Domestic life	2/145 (1.3)	<i>Asking for a specific candy in the store.</i> (BAB-SSC; Brutton & Vanryckeghem, 2007)
7. Interpersonal interactions and relationships	107/145 (73.8)	<i>Does (child's name) start up communication with people in the family?</i> (Communication Profile-Adapted; Bunning et al., 2014)
8. Major life areas	20/145 (13.8)	<i>Asking your teacher a question.</i> (BAB-SSC; Brutton & Vanryckeghem, 2007)
9. Community, social and civic life	12/145 (8.3)	<i>Talking at a party.</i> (BAB-SSC; Brutton & Vanryckeghem, 2007)

Note. ICF = International Classification of Functioning, Disability and Health; FIATS-AAC = Family Impact of Assistive Technology Scale for Augmentative and Alternative Communication; BAB-SSC = Behavior Assessment Battery-Speech Situation Checklist.

disorders, we foresee this age limit may be slightly higher, especially for children with language comprehension problems. More research during the development of the intended item bank should focus on this topic. However, it remains noteworthy that parent-reported items were found for all age groups, although, as mentioned in the introduction, it is important to include the child's own perspective on communication whenever possible (Darling-White, 2017).

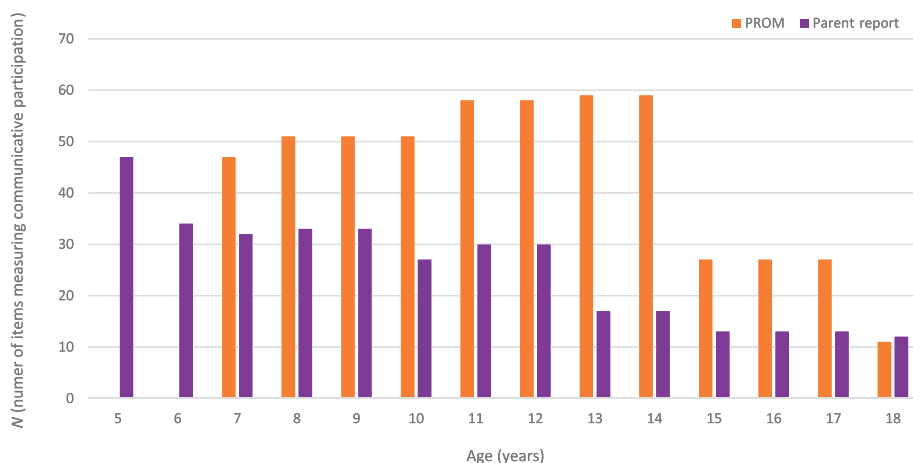
As the identified items will be used to develop an item bank measuring communicative participation for children and adolescents, the age range covered by the items plays an important role. The items identified cover a broad range, from 5 to 18 years old. This, however, does not mean that all items are suitable for the entire age range. For PROM development, it is recommended to take the child's age and the social context into account (Arbuckle & Abetz-Webb, 2013; Darling-White, 2017). As

children grow up, their social context changes, and this could cause that items may become less applicable as the child gets older or are applicable only from a certain age. Creating item pools for specific ages or life stages could be a solution for this problem (Arbuckle & Abetz-Webb, 2013; Darling-White, 2017).

Communicative Participation as Disorder Generic Construct

Another important aspect to consider when reviewing and developing items is the construct they intend to measure. Communicative participation is a disorder-independent, generic construct, relevant for people with all types of communication vulnerabilities (Eadie et al., 2006). There seems to be quite an overlap in content of these instruments, despite the fact that they are developed for people with different communication disorders. Looking at

Figure 3. Included number of items measuring communicative participation per age. Each included PROM was developed for a certain age range. Therefore, not all included items are applicable for every age. This figure shows the results of included items applicable per age. PROM = patient-reported outcome measure.



the instruments that contain the highest percentages of items measuring communicative participation, we find that they have been developed for specific communication disorders: stuttering, hearing loss, and developmental language disorder. For example, in the BAB-SSC (Brutten & Vanryckeghem, 2007), most items were assigned to ICF-CY Domain 7. In the SSQ and FOCUS (Galvin & Noble, 2013; Thomas-Stonell et al., 2010), all items measuring communicative participation were assigned to this domain. This supports the idea that communicative participation is a generic construct.

For a PROM to measure communicative participation in children and adolescents, the items must reflect a variety of social situations (Darling-White, 2017). In this review, most of the items fell in Domain 7 of the ICF-CY activities and participation, which concerns basic and complex interactions with other people, consisting of strangers, friends, relatives, family members, and lovers (World Health Organization, 2007). In other words, this domain describes with whom is being communicated. This is one of the aspects that is described by Yorkston et al. (2008) as reflecting a social context. The other aspects of a social context are “where,” “when,” and “why” (Yorkston et al., 2008). Ter Wal, van Ewijk, Visser-Meily, et al. (2023) added the aspects “pace” and “mode,” based on self-experienced communicative participation situations in adults with communication disorders. In our review, the majority of items reflect only one aspect of communicative participation (with whom), which contrasts with the statement of Darling-White (2017) that items must reflect a variety of social situations. We can therefore conclude that the items identified in this review do not yet provide a comprehensive set of relevant items measuring communicative participation. Additional item development is necessary.

Regarding the coverage of the ICF-CY domains by the items, no items were found referring to the first two domains of the ICF-CY activities and participation component. Consulting literature on the ICF topic revealed that this result was not unexpected. The relevance of each of the domains of the activities and participation component for measuring participation is considered differently in literature (Eyssen et al., 2011). For example, Wilkie et al. (2004) argue that the first three chapters solely describe activities, Domains 4 and 5 describe a mix of activities and participation, and Domains 6–9 describe participation. In the context of communicative participation, the same seems to apply. For example, in Domain 1, “reading” and “writing” are described as activities, where no social context is involved. As soon as the social context is added, for instance, “reading and completing a written assignment in school,” the item would be classified as Domain 8, major life areas. It may therefore not be necessary to include items referring to Domain 1 or 2 in the

development of a new PROM. Domain 4, mobility, is described in literature as representing a mix of activities and participation (Wilkie et al., 2004). However, we did not find any items referring to this domain. Communicative participation in mobility includes, for example, being able to understand spoken and written travel information and interaction with public transport staff. Further research with the target group on relevant participation situations where communication is required should demonstrate whether this domain is actually relevant for the target group.

Findings in Relation to Content Validity

When reviewing measurement instruments for their content validity, relevance for the target populations is an important aspect. Using input from a diverse and representative sample of the target population during instrument development helps to achieve this (Patrick, Burke, et al., 2011). It was beyond the scope of this article to systematically investigate if the target population was involved in the item generation of the reviewed instruments. However, for some of the instruments, it was clear that the target population was not involved in developing the items. For example, the SSQ (Galvin & Noble, 2013) was developed based on adapting existing items from the adult version of this instrument by excluding or modifying items that were not or less applicable to children, according to the researchers. Children with hearing loss or their parents were not involved in this process. Therefore, the relevance of the individual items and comprehensiveness of the identified items in total should be assessed in the following steps of the item bank development.

Limitations

Some limitations of this study should be acknowledged. We included only articles and instruments written in Dutch or English. As a result, relevant instruments with communicative participation items developed in other languages have not been included. We therefore may have missed possible valuable content. Another limitation was that we only included instruments found in published articles with peer-reviewed publications on at least some measurement properties. We did not search the gray literature. The most important consequence of these possible limitations is that there may be relevant items in instruments we did not identify. However, as this literature review is part of a larger content development process, in which concept elicitation in children and adolescents themselves is an equally important source of information for (new) items, we expect important items that we may have missed to come up in that process.

Conclusions and Future Directions

Although this study provides a good basis for the development of an item bank measuring communicative participation, it is apparent that the input from the target population should be obtained as there are uncertainties about the relevance and comprehensiveness of the identified set of items. Conducting a concept elicitation study, where children and adolescents are asked about relevant situations that describe their communicative participation, is an essential next step toward a comprehensive and relevant measurement instrument. In addition, further development will follow the guidelines of the COSMIN initiative for assessing PROMs, in which all measurement properties will be carefully examined to ensure reliability and validity of the item bank (De Vet et al., 2011; Mokkink et al., 2018).

Data Availability Statement

The authors have provided all shareable data in this article and its appendices.

Acknowledgments

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Appendix A (p. 1 of 4)

Search Strategy

Table A1. Search strategy: PubMed.

Search	Filter	Query	20-04-2022
#1	Construct: communication/ participation	("Communication"[Mesh] OR communicat*[tiab] OR "Social Participation"[Mesh] OR "participat*[tiab] OR "engagement*[tiab])	1267217
#2	PROM filter	("Patient Reported Outcome Measures"[Mesh] OR "Quality of Life"[Mesh] OR prom[tiab] OR proms[tiab] OR pro[tiab] OR pros[tiab] OR HRQL[tiab] OR HRQoL[tiab] OR QL[tiab] OR QoL[tiab] OR "quality of life"[tiab] OR "life quality"[tiab] OR "health index*[tiab] OR "health indices"[tiab] OR "health profile*[tiab] OR "health status"[tw] OR ((patient[tiab] OR self[tiab] OR child[tiab] OR parent[tiab] OR carer[tiab] OR proxy[tiab]) AND ((report[tiab] OR reported[tiab] OR reporting[tiab]) OR (rated[tiab] OR rating[tiab] OR ratings[tiab]) OR based[tiab] OR (assessed[tiab] OR assessment[tiab] OR assessments[tiab]))) OR ((disability[tiab] OR function[tiab] OR functional[tiab] OR functions[tiab] OR subjective[tiab] OR utility[tiab] OR utilities[tiab] OR wellbeing[tiab] OR "well being"[tiab]) AND (outcome[tiab] OR outcomes[tiab] OR index[tiab] OR indices[tiab] OR instrument[tiab] OR instruments[tiab] OR measure[tiab] OR measures[tiab] OR questionnaire[tiab] OR questionnaires[tiab] OR profile[tiab] OR profiles[tiab] OR scale[tiab] OR scales[tiab] OR score[tiab] OR scores[tiab] OR status[tiab] OR survey[tiab] OR surveys[tiab]))))	3533564
#3	Population	("Communication Disorders"[Mesh] OR "Hearing Disorders"[Mesh] OR "Voice Disorders"[Mesh] OR "Language disorder*[tiab] OR "Language development disorder*[tiab] OR "language impairment*[tiab] OR "Language delay*[tiab] OR "language deficienc*[tiab] OR "communication disorder*[tiab] OR "Communicative disorder*[tiab] OR "Communicative dysfunction*[tiab] OR "Communication problem*[tiab] OR "communication disabilit*[tiab] OR "Speech delay*[tiab] OR "speech impairment*[tiab] OR "speech disabilit*[tiab] OR "speech defect"[tiab] OR "speech deficienc*[tiab] OR "speech disturbance*[tiab] OR "Speech problem*[tiab] OR "Speech sound disorder*[tiab] OR "Articulation disorder*[tiab] OR "Stuttering"[tiab] OR "stammering"[tiab] OR "cluttering*[tiab] OR "fluency disorder*[tiab] OR "Voice disorder*[tiab] OR "Voice disturbance*[tiab] OR "Voice fatigue*[tiab] OR "distorted hearing"[tiab] OR "Aphonia"[tiab] OR "Dysphonia"[tiab] OR "Horseness"[tiab] OR "hearing impairment*[tiab] OR "hearing dysfunction*[tiab] OR "hearing disorder*[tiab] OR "Pragmatic disorder*[tiab] OR "Auditory processing disorder*[tiab] AND ("child*[tiab] OR "pre-school*[tiab] OR "preschool*[tiab] OR "pediatric*[tiab] OR "paediatric*[tiab] OR "Puberty"[tiab] OR "adolescen*[tiab] OR "teen*[tiab] OR "youth*[tiab] OR "Child"[Mesh] OR "Adolescent"[Mesh] OR "Puberty"[Mesh] OR "Pediatrics"[Mesh])	75542

(table continues)

Appendix A (p. 2 of 4)

Search Strategy

Search	Filter	Query	20-04-2022
#4	Measurement properties filter	(instrumentation[sh] OR methods[sh] OR "Validation Studies"[pt] OR "Comparative Study"[pt] OR "psychometrics"[MeSH] OR psychometr*[tiab] OR clinimetr*[tw] OR clinometr*[tw] OR "outcome assessment (health care)"[MeSH] OR "outcome assessment"[tiab] OR "outcome measure"*[tw] OR "observer variation"[MeSH] OR "observer variation"[tiab] OR "Health Status Indicators"[Mesh] OR "reproducibility of results"[MeSH] OR reproducib*[tiab] OR "discriminant analysis"[MeSH] OR reliab*[tiab] OR unreliab*[tiab] OR valid*[tiab] OR "coefficient of variation"[tiab] OR coefficient[tiab] OR homogeneity[tiab] OR homogeneous[tiab] OR "internal consistency"[tiab] OR (cronbach*[tiab] AND (alpha[tiab] OR alphas[tiab])) OR (item[tiab] AND (correlation*[tiab] OR selection*[tiab] OR reduction*[tiab])) OR agreement[tw] OR precision[tw] OR imprecision[tw] OR "precise values"[tw] OR test-retest[tiab] OR (test[tiab] AND retest[tiab]) OR (reliab*[tiab] AND (test[tiab] OR retest[tiab])) OR stability[tiab] OR interrater[tiab] OR inter-rater[tiab] OR intrarater[tiab] OR intra-rater[tiab] OR intertester[tiab] OR inter-tester[tiab] OR intratester[tiab] OR intra-tester[tiab] OR interobserver[tiab] OR inter-observer[tiab] OR intraobserver[tiab] OR intra-observer[tiab] OR intertechnician[tiab] OR inter-technician[tiab] OR intratechnician[tiab] OR intra-technician[tiab] OR interexaminer[tiab] OR inter-examiner[tiab] OR intraexaminer[tiab] OR intra-examiner[tiab] OR interassay[tiab] OR inter-assay[tiab] OR intraassay[tiab] OR intra-assay[tiab] OR interindividual[tiab] OR inter-individual[tiab] OR intraindividual[tiab] OR intra-individual[tiab] OR interparticipant[tiab] OR inter-participant[tiab] OR intraparticipant[tiab] OR intra-participant[tiab] OR kappa[tiab] OR kappa's[tiab] OR kappas[tiab] OR repeatab*[tw] OR ((replicab*[tw] OR repeated[tw] AND (measure[tw] OR measures[tw] OR findings[tw] OR result[tw] OR results[tw] OR test[tw] OR tests[tw])) OR generaliza*[tiab] OR generalisa*[tiab] OR concordance[tiab] OR (intraclass[tiab] AND correlation*[tiab]) OR discriminative[tiab] OR "known group"[tiab] OR "factor analysis"[tiab] OR "factor analyses"[tiab] OR "factor structure"[tiab] OR "factor structures"[tiab] OR dimension*[tiab] OR subscale*[tiab] OR (multitrait[tiab] AND scaling[tiab] AND (analysis[tiab] OR analyses[tiab])) OR "item discriminant"[tiab] OR "interscale correlation"*[tiab] OR error[tiab] OR errors[tiab] OR "individual variability"[tiab] OR "interval variability"[tiab] OR "rate variability"[tiab] OR (variability[tiab] AND (analysis[tiab] OR values[tiab])) OR (uncertainty[tiab] AND (measurement[tiab] OR measuring[tiab])) OR "standard error of measurement"[tiab] OR sensitiv*[tiab] OR responsive*[tiab] OR (limit[tiab] AND detection[tiab]) OR "minimal detectable concentration"[tiab] OR interpretab*[tiab] OR ((minimal[tiab] OR minimally[tiab] OR clinical[tiab] OR clinically[tiab]) AND (important[tiab] OR significant[tiab] OR detectable[tiab]) AND (change[tiab] OR difference[tiab])) OR (small*[tiab] AND (real[tiab] OR detectable[tiab]) AND (change[tiab] OR difference[tiab])) OR "meaningful change"[tiab] OR "ceiling effect"[tiab] OR "floor effect"[tiab] OR "Item response model"[tiab] OR IRT[tiab] OR Rasch[tiab] OR "Differential item functioning"[tiab] OR DIF[tiab] OR "computer adaptive testing"[tiab] OR "item bank"[tiab] OR "cross-cultural equivalence"[tiab])	10168811

(table continues)

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Search Strategy

Search	Filter	Query	20-04-2022
#5		#1 AND #2 AND #3 AND #4	2649
#6	Exclusion filter	#5 NOT (“addresses”[Publication Type] OR “biography”[Publication Type] OR “case reports”[Publication Type] OR “comment”[Publication Type] OR “directory”[Publication Type] OR “editorial”[Publication Type] OR “festschrift”[Publication Type] OR “interview”[Publication Type] OR “lectures”[Publication Type] OR “legal cases”[Publication Type] OR “legislation”[Publication Type] OR “letter”[Publication Type] OR “news”[Publication Type] OR “newspaper article”[Publication Type] OR “patient education handout”[Publication Type] OR “popular works”[Publication Type] OR “congresses”[Publication Type] OR “consensus development conference”[Publication Type] OR “consensus development conference, nih”[Publication Type] OR “practice guideline”[Publication Type]) NOT (“animals”[Mesh] NOT “humans”[Mesh])	2518

Table A2. Search strategy: Embase.

Search	Filter	Query
#1	Construct: communication or participation	'interpersonal communication'/exp OR 'verbal communication'/exp OR communicat*:ab,ti OR 'social participation'/exp OR 'participat*:ti,ab,kw OR 'engagement*:ti,ab,kw
#2	PROM filter	'hr-pro':ab,ti OR 'hrpro':ab,ti OR 'hrql':ab,ti OR 'hrqol':ab,ti OR 'ql':ab,ti OR 'qol':ab,ti OR 'quality of life':ab,ti OR 'life quality':ab,ti OR 'health index':ab,ti OR 'health indices':ab,ti OR 'health profile':ab,ti OR 'health profiles':ab,ti OR 'health status':ab,ti OR ('patient':ab,ti OR 'self':ab,ti OR 'child':ab,ti OR 'parent':ab,ti OR 'carer':ab,ti OR 'proxy':ab,ti AND ('report':ab,ti OR 'reported':ab,ti OR 'reporting':ab,ti OR 'rated':ab,ti OR 'rating':ab,ti OR 'ratings':ab,ti OR 'based':ab,ti OR 'assessed':ab,ti OR 'assessment':ab,ti OR 'assessments':ab,ti)) OR ('disability':ab,ti OR 'function':ab,ti OR 'functional':ab,ti OR 'functions':ab,ti OR 'subjective':ab,ti OR 'utility':ab,ti OR 'utilities':ab,ti OR 'wellbeing':ab,ti OR 'well being':ab,ti AND ('outcome':ab,ti OR 'outcomes':ab,ti OR 'index':ab,ti OR 'indices':ab,ti OR 'instrument':ab,ti OR 'instruments':ab,ti OR 'measure':ab,ti OR 'measures':ab,ti OR 'questionnaire':ab,ti OR 'questionnaires':ab,ti OR 'profile':ab,ti OR 'profiles':ab,ti OR 'scale':ab,ti OR 'scales':ab,ti OR 'score':ab,ti OR 'scores':ab,ti OR 'status':ab,ti OR 'survey':ab,ti OR 'surveys':ab,ti))
#3	Population	('communication disorder'/exp OR 'hearing disorder'/exp OR 'speech disorder'/exp OR 'Language disorder*:ti,ab,kw OR 'Language development disorder*:ti,ab,kw OR 'language impairment*:ti,ab,kw OR 'Language delay*:ti,ab,kw OR 'language deficienc*:ti,ab,kw OR 'communication disorder*:ti,ab,kw OR 'Communicative disorder*:ti,ab,kw OR 'Communicative dysfunction*:ti,ab,kw OR 'Communication problem*:ti,ab,kw OR 'communication disabilit*:ti,ab,kw OR 'Speech delay*:ti,ab,kw OR 'speech impairment*:ti,ab,kw OR 'speech disabilit*:ti,ab,kw OR 'speech defect':ti,ab,kw OR 'speech deficienc*:ti,ab,kw OR 'speech disturbance*:ti,ab,kw OR 'Speech problem*:ti,ab,kw OR 'Speech sound disorder*:ti,ab,kw OR 'Articulation disorder*:ti,ab,kw OR 'Stuttering':ti,ab,kw OR 'stammering':ti,ab,kw OR 'cluttering*:ti,ab,kw OR 'fluency disorder*:ti,ab,kw OR 'Voice disorder*:ti,ab,kw OR 'Voice disturbance*:ti,ab,kw OR 'Voice fatigue*:ti,ab,kw OR 'distorted hearing':ti,ab,kw OR 'Aphonia':ti,ab,kw OR 'Dysphonia':ti,ab,kw OR 'Horseness':ti,ab,kw OR 'hearing impairment*:ti,ab,kw OR 'hearing dysfunction*:ti,ab,kw OR 'hearing disorder*:ti,ab,kw OR 'Pragmatic disorder*:ti,ab,kw OR 'Auditory processing disorder*:ti,ab,kw) AND ('child*:ti,ab,kw OR 'pre-school*:ti,ab,kw OR 'preschool*:ti,ab,kw OR 'pediatric*:ti,ab,kw OR 'paediatric*:ti,ab,kw OR 'Horseness':ti,ab,kw OR 'adolescen*:ti,ab,kw OR 'teen*:ti,ab,kw OR 'youth*:ti,ab,kw OR 'child'/exp OR 'adolescent'/exp OR 'adolescence'/exp OR 'pediatric'/exp)

(table continues)

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Search Strategy

Search	Filter	Query
#4	Measurement properties filter	'intermethod comparison'/exp OR 'data collection method'/exp OR 'validation study'/exp OR 'feasibility study'/exp OR 'pilot study'/exp OR 'psychometry'/exp OR 'reproducibility'/exp OR reproducib*:ab,ti OR 'audit':ab,ti OR psychometr*:ab,ti OR clinimetr*:ab,ti OR clinometr*:ab,ti OR 'observer variation'/exp OR 'observer variation':ab,ti OR 'discriminant analysis'/exp OR 'validity'/exp OR reliab*:ab,ti OR valid*:ab,ti OR 'coefficient':ab,ti OR 'internal consistency':ab,ti OR (cronbach*:ab,ti AND ('alpha':ab,ti OR 'alphas':ab,ti)) OR 'item correlation':ab,ti OR 'item correlations':ab,ti OR 'item selection':ab,ti OR 'item selections':ab,ti OR 'item reduction':ab,ti OR 'item reductions':ab,ti OR 'agreement':ab,ti OR 'precision':ab,ti OR 'imprecision':ab,ti OR 'precise values':ab,ti OR 'test-retest':ab,ti OR ('test':ab,ti AND 'retest':ab,ti) OR (reliab*:ab,ti AND ('test':ab,ti OR 'retest':ab,ti)) OR 'stability':ab,ti OR 'interrater':ab,ti OR 'inter-rater':ab,ti OR 'intrarater':ab,ti OR 'intra-rater':ab,ti OR 'intertester':ab,ti OR 'inter-tester':ab,ti OR 'intratester':ab,ti OR 'intratester':ab,ti OR 'interobserver':ab,ti OR 'inter-observer':ab,ti OR 'intraobserver':ab,ti OR 'intraobserver':ab,ti OR 'inter-technician':ab,ti OR 'inter-technician':ab,ti OR 'intraexaminer':ab,ti OR 'interexaminer':ab,ti OR 'inter-examiner':ab,ti OR 'intraexaminer':ab,ti OR 'intraexaminer':ab,ti OR 'interassay':ab,ti OR 'inter-assay':ab,ti OR 'intraassay':ab,ti OR 'intra-assay':ab,ti OR 'interindividual':ab,ti OR 'inter-individual':ab,ti OR 'intraindividual':ab,ti OR 'intra-individual':ab,ti OR 'interparticipant':ab,ti OR 'inter-participant':ab,ti OR 'intraparticipant':ab,ti OR 'intraparticipant':ab,ti OR 'kappa':ab,ti OR 'kappas':ab,ti OR 'coefficient of variation':ab,ti OR repeatab*:ab,ti OR (replicab*:ab,ti OR 'repeated':ab,ti AND ('measure':ab,ti OR 'measures':ab,ti OR 'findings':ab,ti OR 'result':ab,ti OR 'results':ab,ti OR 'test':ab,ti OR 'tests':ab,ti)) OR generaliza*:ab,ti OR generalisa*:ab,ti OR 'concordance':ab,ti OR ('intraclass':ab,ti AND correlation*:ab,ti) OR 'discriminative':ab,ti OR 'known group':ab,ti OR 'factor analysis':ab,ti OR 'factor analyses':ab,ti OR 'factor structure':ab,ti OR 'factor structures':ab,ti OR 'dimensionality':ab,ti OR subscale*:ab,ti OR 'multitrait scaling analysis':ab,ti OR 'multitrait scaling analyses':ab,ti OR 'item discriminant':ab,ti OR 'interscale correlation':ab,ti OR 'interscale correlations':ab,ti OR ('error':ab,ti OR 'errors':ab,ti AND (measure*:ab,ti OR correlat*:ab,ti OR evaluat*:ab,ti OR 'accuracy':ab,ti OR 'accurate':ab,ti OR 'precision':ab,ti OR 'mean':ab,ti)) OR 'individual variability':ab,ti OR 'interval variability':ab,ti OR 'rate variability':ab,ti OR 'variability analysis':ab,ti OR ('uncertainty':ab,ti AND ('measurement':ab,ti OR 'measuring':ab,ti)) OR 'standard error of measurement':ab,ti OR sensitiv*:ab,ti OR responsive*:ab,ti OR ('limit':ab,ti AND 'detection':ab,ti) OR 'minimal detectable concentration':ab,ti OR interpretab*:ab,ti OR (small*:ab,ti AND ('real':ab,ti OR 'detectable':ab,ti) AND ('change':ab,ti OR 'difference':ab,ti)) OR 'meaningful change':ab,ti OR 'minimal important change':ab,ti OR 'minimal important difference':ab,ti OR 'minimally important change':ab,ti OR 'minimally important difference':ab,ti OR 'minimal detectable change':ab,ti OR 'minimal detectable difference':ab,ti OR 'minimally detectable change':ab,ti OR 'minimally detectable difference':ab,ti OR 'minimal real change':ab,ti OR 'minimal real difference':ab,ti OR 'minimally real change':ab,ti OR 'minimally real difference':ab,ti OR 'ceiling effect':ab,ti OR 'floor effect':ab,ti OR 'item response model':ab,ti OR 'irt':ab,ti OR 'rasch':ab,ti OR 'differential item functioning':ab,ti OR 'dif':ab,ti OR 'computer adaptive testing':ab,ti OR 'item bank':ab,ti OR 'cross-cultural equivalence':ab,ti
#5		#1 AND #2 AND #3 AND #4

Appendix B

Item Numbers of Reviewed Items Measuring Communicative Participation

Instrument	Author instrument	Number of included items
Behavior Assessment Battery–Speech Situation Checklist	Brutten & Vanryckeghem (2007)	01, 04, 06, 07, 08, 10, 11, 12, 13, 16, 17, 24, 26, 28, 29, 30, 32, 37, 41, 42, 45, 47, 48, 49, 50, 52, 54, 55
Speech, Spatial and Qualities of Hearing Scale (SSQ)	Galvin & Noble (2013)	A: 01, 02, 03, 04, 05, 06 07, 08 D: 01, 02
Focus on the Outcome of Communication Under Six (FOCUS)	Thomas-Stonell et al. (2010)	1: 04, 08, 13, 15, 26, 27, 30, 31, 33 2: 03, 06, 10, 11, 12, 13, 14, 15, 16
Caregiver Report of Behaviors & Events (CROBE-DHH)	Patrick et al. (2018)	5–7: 01, 03, 04, 05, 07, 09 8–10: 01
Communication Profile-Adapted	Bunning et al. (2014)	E: 01, 02, 08, 11, 14 S: 01
Overall Assessment of the Speaker’s Experience of Stuttering for School-Age Children (OASES 7–12)	Yaruss & Quesal (2006)	36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50
Youth Quality of Life Instrument–Deaf and Hard of Hearing Module (YQOL-DHH)	Patrick, Edwards, et al. (2011)	03, 05, 08, 09, 23, 24, 31
Functioning after Pediatric Cochlear Implantation (FAPCI)	Lin et al. (2007)	09, 18, 19, 20, 21
Overall Assessment of the Speaker’s Experience of Stuttering for School-Age Children (OASES 13–17)	Yaruss & Quesal (2006)	41, 42, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60
Auditory Behavior in Everyday Life (ABEL)	Purdy et al. (2002)	01, 04, 05, 13
VELO instrument	Skirko et al. (2012)	11, 12, 13
Behavior Assessment Battery–Communication Attitude Test	Brutten & Vanryckeghem (2007)	02, 05, 17, 21
Family Impact of Assistive Technology Scale for Augmentative and Alternative Communication (FIATS-AAC)	Delarosa et al. (2012)	02, 09, 15, 21, 24, 26, 37, 42, 44
Pediatric Voice-Related Quality of Life (PV-RQOL)	Boseley et al. (2006)	06
Pediatric Voice Handicap Index (pVHI)	Zur et al. (2007)	02, 05
Assessment of Conversational Pragmatics (ACP)	Gentilleau-Lambin et al. (2019)	14, 23
Early Language Scale (ELS)	Visser-Bochane et al. (2021)	04, 10
KIDSCREEN-27	Ravens-Sieberer et al. (2001)	Part 3: 05
Children with Cochlear Implants: Parental Perspectives	O’Neill et al. (2004)	01, 06
Functional Listening Index–Paediatric (FLI-P)	Davis et al. (2022)	01
Children’s Communication Checklist (CCC)	Bishop (1998)	26
Parental perspective instrument for pediatric cochlear implantation	Archbold et al. (2008)	27
Airway–Dyspnoea–Voice–Swallow (ADVS)	Nouraei et al. (2017)	—
Children’s Communication Checklist-2	Bishop (2003)	—
Generic Lifestyle Assessment Questionnaire (LAQ-G)	Jessen et al. (2003)	—
Hearing Environments and Reflection on Quality of Life Parent-Proxy Preschool (HEAR-QL)	Yu et al. (2021)	—
Intelligibility in Context Scale (ICS)	McLeod et al. (2012)	—
Children’s Voice Handicap Index (C-VHI-10)	Ricci-Maccarini et al. (2016)	—
La Trobe Communication Questionnaire	Douglas et al. (2000)	—