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Research Article

Exploring the Relevance of Items in the Communicative Participation Item Bank (CPIB) for Individuals With Hearing Loss

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Purpose: The Communicative Participation Item Bank (CPIB) was developed to evaluate participation restrictions in communication situations for individuals with speech and language disorders. This study evaluated the potential relevance of CPIB items for individuals with hearing loss.
Method: Cognitive interviews were conducted with 17 adults with a range of treated and untreated hearing loss, who responded to 46 items. Interviews were continued until saturation was reached and prevalent trends emerged. A focus group was also conducted with 3 experienced audiologists to seek their views on the CPIB. Analysis of data included qualitative and quantitative approaches.
Results: The majority of the items were applicable to individuals with hearing loss; however, 12 items were identified as potentially not relevant. This was largely attributed to the items' focus on speech production rather than hearing. The results from the focus group were in agreement for a majority of items.
Conclusions: The next step in validating the CPIB for individuals with hearing loss is a psychometric analysis on a large sample. Possible outcomes could be that the CPIB is considered valid in its entirety or the creation of a new questionnaire or a hearing loss–specific short form with a subset of items is necessary.

Most of the life roles in which we engage, such as at home, at work, and in social situations, require communication that involves a bidirectional transfer of information among people. The term *communicative participation* has been described as "taking part in life situations that involve an exchange of information, ideas, or feelings" (Eadie et al., 2006, p. 309). This term is based on the definition of participation from the World Health Organization (2001) International Classification of Functioning, Disability, and Health (ICF), which defines participation as involvement in life roles. Communication is considered a critical element of life participation by hearing loss experts and individuals with hearing loss (Granberg, Pronk, et al., 2014; Granberg, Swanepoel, Englund, Möller, & Danermark, 2014). According to the ICF and other biopsychosocial frameworks of health, the impact of a health condition on life participation is shaped by a combination of variables, including the nature and extent of physical injury or impairment, the characteristics of the individual, and the environmental context. In a similar manner, the impact that a communication disorder, such as hearing loss, has on a person's participation in life situations might depend on the severity of the hearing loss, the characteristics of that individual, and the listening conditions of the environment, among other issues. Audiologists who have a deep appreciation for how a client's hearing loss influences participation in real-life situations might be better able to meet the habilitation or rehabilitation needs of their clients via amplification, aural rehabilitation, counseling, or other avenues. To achieve these goals, however, clinicians and researchers need validated instruments to measure the impact of hearing loss on life participation and the subsequent impact of intervention. The purpose of this study was to begin validation of a measure of communicative participation, the Communicative Participation Item Bank (CPIB), for use with individuals with hearing loss.

Hearing loss has a significant impact on life roles with both emotional and physical consequences (e.g., Chia et al., 2007; Hickson et al., 2008). The use of patient-reported questionnaires has long been advocated to capture these experiences from the perspective of the person who lives with the condition. Although surveys exist in audiology that include items addressing participation restrictions

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(e.g., Self-Assessment of Communication, Schow & Nerbonne, 1982; Hearing Handicap Inventory of the Elderly [HHIE], Ventry & Weinstein, 1982; Communication Profile for the Hearing Impaired, Demorest & Erdman, 1987), there are limitations in using these as measures of communicative participation. For example, many current surveys contain more than one construct (e.g., emotional responses, activity limitations, and a reduction in participation on the HHIE), which makes interpreting results difficult (as evidenced by the HHIE correlating with both activity and participation; Chisolm, Abrams, McArdle, Wilson, & Doyle, 2005). Many surveys do not ask about a wide range of environments and situations in which participation in communication occurs, thus giving only a partial window into participation restrictions associated with hearing loss. Last, although many patient-reported outcomes in audiology exist, few are used consistently between studies or clinicians, indicating a lack of consensus in the field as to which ones are most important (Granberg, Dahlström, Möller, Kähäri, & Danermark, 2014).

The CPIB is a patient-reported instrument designed to measure the extent to which communication disorders interfere with participation in a wide range of daily conversational situations (Baylor et al., 2013; Baylor, Yorkston, Eadie, Miller, & Amtmann, 2009; Yorkston et al., 2008). One of the guiding principles in the development of the CPIB was that it would be a unidimensional instrument focusing on the construct of communicative participation. Thus, the questions do not ask about physical symptoms of the communication disorder, emotional reactions, or other issues. All of the items focus on the impact of the communication disorder on participation in everyday conversational situations. Another key principle in the development of the CPIB was that it would be applicable across different communication disorders. For that reason, items do not refer to specific symptoms or characteristics of a communication disorder but instead use a more general wording. All CPIB items start with the stem, "Does your condition interfere with…" followed by various conversational situations, such as, "…making a phone call to get information" or "…communicating in a small group of people." Respondents choose from four response options of *not at all, a little, quite a bit,* and *very much*. The CPIB was developed using item response theory (IRT; Fries, Bruce, & Cella, 2005; Hambleton, Swaminathan, & Rogers, 1991; Reeve et al., 2007). As such, it was created for the potential of adaptive testing. The CPIB item bank consists of 46 items. One 10-item short form is currently available for clinical and research use (Baylor et al., 2013). That short form has been validated for adults with speech and language disorders (Baylor et al., 2016, 2013). Future goals for CPIB development include computerized adaptive testing (Cook, O'Malley, & Roddey, 2005).

The CPIB was developed using methods recommended and followed by the National Institutes of Health initiative Patient-Reported Outcomes Measurement Information System (PROMIS, nihpromis.org). PROMIS was established to advance the measurement science of patient-reported outcomes across a wide range of health domains (Cella et al., 2007). PROMIS has advocated for a systematic sequence of steps in the development of patient-reported outcomes. One of these steps is a review of candidate items through the process of cognitive interviewing before proceeding to statistical analyses, typically with IRT (Fries et al., 2005; DeWalt, Rothrock, Yount, & Stone, 2007; Willis, 2005). Cognitive interviewing is widely used in instrument development, and it is a process in which participants who represent the targeted respondents for a questionnaire are asked to provide feedback on candidate items. Participants are generally asked to work through the set (or subset) of items using a "think out loud" technique. This technique is intended to make transparent the mental processes or thoughts that participants go through as they answer each question. Respondents are asked to discuss their reactions to the items in terms of what concepts or situations each item brings to mind, anything that is confusing or offensive about the item, and how they would respond to the item and why. Through this method, instrument developers are able to better understand how participants interpret items and are therefore able to identify items that may need revision because they are unclear, irrelevant, or otherwise problematic for individuals in the targeted respondent group. Cognitive interviews explore not only the item stems but also structural aspects of the items, such as the response options, providing opportunities to observe if respondents interpret the response options as intended by the developers, if respondents find the range of response options applicable to reflect the range of their experiences, and if respondents feel that their perspectives are reflected in the response options provided. Through these cognitive interviewing methods, instrument developers are able to improve the likelihood that the items indeed target the construct of interest and will be received as relevant, accessible, and acceptable to the target population.

The CPIB underwent prior cognitive interviewing examination with 44 individuals representing different populations of speech and language disorders (Baylor, Burns, Eadie, Britton, & Yorkston, 2011; Yorkston et al., 2008). These diagnostic groups included Parkinson's disease, stroke, multiple sclerosis, head and neck cancer, amyotrophic lateral sclerosis, and spasmodic dysphonia (Baylor et al., 2011; Yorkston et al., 2008). Although several participants included in these prior studies did have hearing loss in addition to a speech or language disorder, the primary focus in these prior interviews was the impact of the speech or language impairment on communicative participation. The CPIB has gone on through item calibration using IRT for finalization of the item bank and one disorder-generic short form as described above.

This study represents the initial step in validating the CPIB for use with people with hearing loss but no other communication disorder. This branch of research continues the goal of developing the CPIB to be applicable across a wide range of communication disorders. If valid for use with people with hearing loss, the CPIB would facilitate both clinical and research endeavors to understand similarities and differences in the life impact across different types of communication disorders. In keeping with biopsychosocial frameworks, such as the ICF, interventions that target issues related to environmental modifications might benefit people across different communication disorders, and the impact of these interventions might best be measured by a single instrument validated for multiple populations. Another advantage of using a disorder-generic instrument is that many of the services that audiologists provide are not considered an essential health care benefit according to Accountable Care Organizations (ACOs). ACOs were created by the Affordable Care Act to be a new model for health care delivery systems and are responsible for Medicare reimbursements with health care providers and insurers following their precedents. Establishing that hearing loss restricts participation in a similar pattern to communication disorders that are considered essential by the ACO may have important future implications.

The purpose of this study, therefore, was to conduct the first exploration of the use of the CPIB with people with hearing loss by completing cognitive interviews with individuals with hearing loss. In addition, input from clinical audiologists was sought. The research question was if the existing CPIB items would be regarded as relevant and acceptable to adults with hearing loss, or if revisions would be needed for this population, what revisions would these stakeholders recommend.

Method

This study was conducted with two stakeholder groups for triangulation purposes. First, cognitive interviews were conducted with adults with hearing loss to obtain their feedback on the CPIB. Second, a focus group was held with audiologists to gather their perspectives on the instrument. Although the primary focus of the study was understanding the perspectives of individuals with hearing loss with regards to the CPIB, the perspective of professionals with extensive clinical experience working with people with hearing loss was also considered valuable in exploring how the questionnaire might be received by clients in clinical practice. In focus groups, ideas might be generated out of the group discussion that might not have come up with each audiologist in an individual interview. Of particular interest were broader perspectives on the use of patient-reported outcomes, such as current practice, recommendations, and preferences, which were all topics that were appropriate for a group discussion. The methods for each stakeholder group are described below. All methods were approved by the Institutional Review Board at the University of Washington and were found to meet exempt status (i.e., consent is not needed from participants due to low risk).

Cognitive Interviews With Individuals With Hearing Loss

This section describes the methods used to conduct cognitive interviews with adults with hearing loss.

Participants

Individuals with hearing loss were recruited from a communication studies volunteer database at the University of Washington. Basic demographic and current pure-tone hearing threshold (within 6 months) data were available in the database. Participants were selected purposefully to represent maximum variability for the characteristics of age, type of hearing loss, and degree of hearing loss. All participants met the inclusion criteria of age 18 years and older, community-dwelling adults, using speech as a primary mode of communication, having English as their primary language, and having hearing loss (defined as a pure-tone average of 500, 1000, and 2000 Hz poorer than 20 dB HL in at least one ear). Exclusion criteria included using another mode of communication besides verbal (e.g., sign language) and individuals with a pure-tone average of 90 dB HL or greater. At first, recruitment drew mainly individuals with hearing aids. In order to observe possible differences in response patterns of individuals with and without hearing aids, additional participants without hearing aids were targeted for recruitment toward the end of the study. A minimum of 12 participants were targeted for recruitment on the basis of recommendations that key issues or problems with an item set are typically identified with that sample size (Willis, 2005). However, recruitment continued to the point of saturation at which repeated interviews were not generating new content in the feedback from participants. Participants were paid $10/hr for their time.

Data Collection

Participants attended one individual meeting with researchers at the University of Washington, with the session lasting between 60 and 90 min. If the participants wore hearing aids, they did so during the interviews. A pocket talker was also available for participants; however, no one required accommodations to complete the interview. Cognitive interviewing methods were patterned after those recommended by Willis (2005). Participants were instructed that the purpose of the study was to get their feedback on the CPIB questionnaire to help the researchers know if this was an appropriate questionnaire to use with people with hearing loss and if they would recommend any changes to the questionnaire. Participants were presented with all 46 items in the full CPIB item bank. Participants were asked to read each item and answer it according to how they currently felt about their experiences with their hearing loss. After answering each question, participants were asked to describe their impressions of the item and why they chose the response option they did. Sample interview questions included “What situations did this item make you think of?” This question was intended to evaluate if the types of situations participants associated with the items were those intended by the instrument authors. Another interview question was “Why did you answer this question as you did?” This question was intended to elicit a more detailed description from the participants about their experiences in that situation, which allowed the researchers to explore if the extent of interference they rated in their answer choice appeared to represent their open-ended descriptions of their experiences. Participants were also asked if there was anything that they would change, for example, wording being confusing, ambiguous, or otherwise problematic. They were also asked to describe if the item was relevant to them and their experiences and also if there were any situations that were relevant to them that did not appear to be represented in the questionnaire.

As described above, participants were asked to answer the items from the perspective of their current experiences with their hearing loss. In an effort to explore potential sensitivity to treatment of the CPIB, after completion of the cognitive interview portion of the session, those participants who wore hearing aids were asked to complete the 10-item short form of the CPIB again, but this time thinking about how they would have answered the items before they started wearing hearing aids. Their scores on these 10 items were compared between the two perspectives of with and without hearing aids to evaluate any change in response patterns.

There were three interviewers who rotated interview duties with two of the three present at every session. The interviewers included one speech-language pathologist (CB) who had prior experience with the research methods used in this study and is one of the CPIB developers. One interviewer was an audiologist (CM), and the other was a doctor of audiology graduate student (KB) at the University of Washington. During the interviews, one researcher was the lead interviewer who asked most of the questions. Although the sessions were audio-recorded, the other interviewer(s) took detailed field notes as a backup to the recording and also to document content, such as the researcher's impressions, follow-up questions to ask, and other information that would not be captured by an audio recording.

After the sessions, the recordings were transcribed verbatim for analysis. Emerging data were reviewed by the research team after every three to four interviews. The data appeared to approach saturation at about 13 participants as strong and consistent trends emerged repeatedly in the feedback provided by the participants. As the point of saturation appeared to be nearing, the researchers purposefully recruited four additional participants who did not wear hearing aids to ensure a broad range of hearing experiences were represented in the sample. As no new trends were identified in the results from these new participants, data collection was ended after 17 participants.

Data Analysis

Both quantitative and qualitative descriptive analyses were used to summarize the results. To organize the feedback about each item, an Excel spreadsheet was created with one line dedicated to each item and one column dedicated to each participant. Thus the data formed a grid documenting the feedback of each participant for every item. We reviewed transcripts, extracted the comments that contained feedback for each item, and input those comments into the spreadsheet. Feedback about each item was compared across participants to observe for trends. In addition, comments that participants made that applied to the questionnaire in general, such as relevance to people with hearing loss or missing situations, were summarized across participants.

Descriptive quantitative data were analyzed to examine how the different response options were utilized by participants. The frequency with which the different response options (i.e., *not at all, a little, quite a bit, very much*) were chosen by participants were tallied for each CPIB item. Exploring the distribution of responses across the four response categories can provide preliminary information about the ability of the item to capture a range of experiences for participants. For example, if all response options are utilized for an item, that might suggest that individuals in that population have a range of experiences and that this item can capture that range. If only a limited number of response options is used by participants, this might suggest that the item does not sufficiently capture a range of different experiences or might not be sensitive to relevant experiences for that population. Due to the small sample size, results of this analysis provide an indication of response patterns but are not conclusive about measurement properties of the items.

Focus Group With Audiologists

This section describes the methods for the audiology focus group.

Participants

Participants for the focus group were recruited by sending an email to 10 audiologists in the Seattle area who already had an established relationship with the University of Washington by supervising our audiology graduate students. The inclusion criteria were that the audiologists were currently practicing and at least half of their patient load was over the age of 18 years. Three audiologists (one man, two women) participated. One audiologist owned a private practice, which served adults and children in equal proportions. The other two audiologists worked in the University of Washington clinic, for which one provided diagnostic and amplification services for adults and the other provided aural rehabilitation services. All three audiologists had at least 25 years of experience. Two of the audiologists regularly used patient-reported questionnaires with adult patients, and the third audiologist did not report using any questionnaires.

Data Collection

The CPIB was emailed to the audiologists 1 week prior to the focus group, and they were asked to read through it to familiarize themselves with its content before the meeting. The focus group took place in the early evening in a meeting room at the University of Washington's Speech and Hearing Clinic. Two members of the research team served as moderators (CB and CM). Two students served as note takers and documented participant comments via field notes. After a short introduction by the moderator on the history of the CPIB research to date and the purpose of the focus group, the moderators led a discussion of each CPIB item to seek feedback from the audiologists on if the question was relevant to individuals with hearing loss and/or if any wording was confusing. The participants were encouraged to share any thoughts about the items in general. The session lasted 1.5 hr, and refreshments were provided, but participants volunteered their time.

Data Analysis

The comments made by focus group participants were summarized in an Excel spreadsheet for each CPIB item.

Trustworthiness

Several steps were taken to promote trustworthiness of data for this study (Lincoln & Guba, 1985). In the cognitive interviews, recruitment and data collection continued until saturation was achieved in that no new trends in participant feedback were observed as new participants were interviewed. Participants were selected purposefully during the cognitive interviews to represent maximum variability for the characteristics of age, gender, type of hearing loss, degree of hearing loss, and experience with hearing aids. Attempting to gather input from individuals representing a range of experiences increases transferability of results to others with hearing loss. Last, multiple members of the research team were involved both in data collection and analysis. This allowed the researchers to compare viewpoints and challenge each other on emerging trends in the data to ensure that the summary reflected the viewpoints of the participants.

The completion of a focus group with audiologists, in addition to the cognitive interviews with people with hearing loss, enabled triangulation of data in terms of seeking input from multiple sources and perspectives. Furthermore, the focus group included audiologists with experience across a range of settings (community clinics, hospitals, and university clinics) to again capture a diversity of viewpoints.

Results

Description of Participants With Hearing Loss

A total of 17 participants with hearing loss were interviewed in this study, 56% of whom were women; 44% were men. The mean age of participants was 65 years, and the mean duration of hearing loss was 19 years. Demographic information for each individual participant as well as summary demographic data are presented in Table 1. On average, the interviews took 76 min to complete (median = 78 min, range = 61 to 87 min).

Summary of Feedback From Participants With Hearing Loss

The primary question in this study was whether or not people with hearing loss would consider the CPIB items relevant to their experiences such that this might serve as a useful instrument for capturing the impact of hearing loss on communicative participation. The results suggested that many, although not all, of the CPIB items were regarded as relevant to hearing loss by participants. Table 2 sorts the items into three categories: (a) items relevant to hearing loss according to participants, (b) items potentially not relevant to hearing loss, and (c) items with confusing wording that made determination of relevance difficult. For the purposes of summarizing the results, an arbitrary cutoff point was chosen that if five or more of the 17 individuals with hearing loss expressed concern about the relevance of an item to their experiences with hearing loss, then that item was categorized as not relevant in Table 2.

Of the 46 items in the CPIB, 33 were regarded as relevant to the experiences of living with hearing loss by participants with hearing loss. Items considered relevant to participants' experiences included "…having a conversation in a noisy place," "…having a conversation while riding in a car," and "…communicating in a large group of people." Participants' feedback provided illustrations of how these items captured situations that the participants with hearing loss experienced. For example, on the item "…getting your turn in a fast-moving conversation," Participant 8 said, "Sometimes I can be a little bit hesitant; before I speak up, I want to make sure I'm on the same wavelength as everybody else. And if I'm not hearing everything that's happening, I'm a little reticent." On the item "…talking with people you do not know," Participant 6 said, "It really depends on their voice. With people you know, you know whether their voice will be strong or weak." Another example comes from Participant 3 on the item "…making a witty or funny comment in a conversation" who said, "This is assuming you heard it correctly."

Twelve CPIB items were placed in the category of not being relevant to individuals with hearing loss. The primary trend in the feedback regarding these items was that the focus of the items was on speech production rather than on hearing or understanding. Examples of these items included "…expressing thanks or appreciation," for which Participant 3 said, "My hearing loss doesn't stop me from talking or communicating my side." Another example for the item "…giving personal advice to help a family member or friend" was given by Participant 7: "This isn't relevant because I'm the one talking." And last, for the item "…giving someone detailed information," Participant 2 said, "This doesn't involve hearing. I'm in charge. Receiving information would be a problem. I would have put *quite a bit* if it focused on receiving."

For most of the items, participants suggested few or no changes to wording other than those described in the prior paragraph, which would have made the items that they regarded as less relevant to hearing loss more relevant. Participants generally reported that items were easy to understand with one exception. This item was "…communicating with others when and where you choose." Participant 4 represented the feedback of several participants when he said, "I don't understand the question."

Table 1. Demographics of participants with hearing loss, including gender (F = female, M = male), age (years), employment status, length of time with hearing loss (years, self-reported), pure-tone average (PTA; right and left, 500, 1000, 2000 Hz), type of hearing loss (SNHL = sensorineural; CHL = conductive; MHL = mixed), and length of time using hearing aids (years, self-reported, n/a = does not own hearing aids).

Participant	Gender	Age	Employment status	Time with hearing loss	PTA, right	PTA, left	Type of hearing loss	Time with aids
1	F	77	Retired	6	43	60	CHL	3.0
2	F	79	Retired	14	47	43	MHL	14.0
3	M	68	Retired	20	27	30	SNHL	3.5
4	M	70	Retired	13	22	18	SNHL	n/a
5	F	68	Retired	13	42	33	SNHL	13.0
6	M	29	Full-time	16	65	63	SNHL	10.0
7	F	69	Part-time	66	85	77	SNHL	54.0
8	F	69	Retired	41	42	43	SNHL	41.0
9	F	81	Retired	30	63	65	SNHL	30.0
10	M	75	Retired	45	45	45	MHL	6.0
11	F	89	Retired	8	47	40	SNHL	8.0
12	M	26	Full-time	23	82	73	MHL	23.0
13	F	57	Full-time	8	27	28	SNHL	0.5
14	M	80	Part-time	7	43	43	SNHL	n/a
15	M	45	Full-time	10	50	42	SNHL	n/a
16	F	70	Part-time	4	22	27	SNHL	n/a
17	F	52	Full-time	2	8	37	SNHL	n/a
Mean	M: 41%, F: 56%	65	Retired: 53%, Full-time: 25%, Part-time: 18%	19	45	45		Hearing aid users 71%

In addition to the feedback about relevance to living with hearing loss, participants with hearing loss were invited to share any other feedback they had about improving the items. Several participants commented that further context was desired for some items. For example, many participants wanted to know if the conversation was happening in quiet or noise, if it was a one-on-one conversation or in a group, and if visual cues were available. Participants indicated that their answer would depend on these variables in the situation, so specifying these features of the environment was important. Participants were asked if there were any relevant situations that were not included in the questionnaire but should be. No clear trends emerged. Various participants suggested situations that were personally relevant to them, such as going swimming or going to the theater, but these were not raised as relevant examples by a majority of participants. Last, participants were asked how they would feel about receiving a questionnaire like this when visiting an audiologist's or doctor's office. All participants said they would find this questionnaire relevant, but to varying degrees with comments such as "yes, very relevant" (Participant 2) to "yes, if some questions were removed" (Participant 9).

Summary of Response Options Chosen by Participants With Hearing Loss

Table 2 presents the tallies of how many participants chose each response option for each of the 46 CPIB items during the first portion of the cognitive interviews in which participants were asked to respond according to how they currently felt about their experiences with hearing loss. Table 3 presents the tallies of the response options for the 10 items in the short form for both presentations of this form: when participants answered the items according to how they currently felt and then how they think they would have answered before they started wearing hearing aids (pretreatment). In general, items with good measurement properties will have participants responding in every response category, which shows that the item captures a range of experiences in the population. Future research will require quantitative investigations of measurement properties, but this descriptive analysis provides initial evidence as to if participants were willing to use the range of response options.

In looking across both Tables 2 and 3, all response options were utilized for most items that participants found relevant to hearing loss, particularly when considering both aided and unaided conditions in Table 3. For some items, some response options were used less frequently, but for a few of these items this reflected the importance of the situation to people with hearing loss. For example, for the items "…having a conversation in a noisy place" and "…having a conversation while riding in a car," no participants indicated that they experienced no interference in that situation. Although this suggests a less-than-ideal use of the range of response categories, the feedback from participants clarified that these situations were problematic for most individuals and highly relevant to their experiences living with hearing loss; thus, these were important items to retain in the CPIB.

For the items in Table 2 that were found to not be as relevant to people with hearing loss, the dominant response pattern was to choose the *not at all* response category, suggesting that participants felt that their hearing loss did not interfere with participating in these situations. This strong trend toward experiencing no or little restrictions in these situations might add support to questioning the relevance or appropriateness of these items for individuals with hearing loss.

Table 2. For each item in the survey, a summary of concerns and the response distribution in each answer category across participants is displayed.

1. Items relevant to hearing loss

Does your condition interfere with…	**Not at all**	**A little**	**Quite a bit**	**Very much**	**Summary of concerns**
…having a conversation in a noisy place?	0	0	7	10	None
…having a conversation while riding in a car?	0	6	7	4	None
…communicating in a large group of people?	5	2	3	7	None
…visiting with others in a public place?	1	7	6	3	None
…talking with people you do not know?	1	9	5	2	None
…getting your turn in a fast-moving conversation?	4	4	4	5	None
…making a phone call to get information?	5	6	1	5	None
…taking a phone message?	4	8	1	4	Not relevant (2)
…communicating at social gatherings where you know most of the people?	2	8	5	2	None
…talking with people you know?	2	10	5	0	None
…making small talk?	3	9	5	0	Not relevant (1)
…making comments to family or friends about a TV show or movie you are watching together?	9	2	6	0	Focus on speech production (3) Not relevant (3)
…communicating in a small group of people?	2	10	4	1	None
…negotiating?	8	6	3	0	Not relevant (3)
…greeting someone you know at a social gathering?	8	5	3	1	Not relevant (3)
…having a long conversation with someone you know about a book, movie, show, or sports event?	5	9	3	0	None
…communicating during an emergency?	7	7	1	2	Focus on speech production (1) Not relevant (3)
…making new acquaintances?	7	7	2	1	None
…asking for help from a stranger?	7	7	1	2	Not relevant (3)
…talking with a clerk in a store about a problem with a bill or purchase?	4	11	2	0	Focus on speech production (1) Not relevant (2)
…communicating when you are out in your community?	3	11	2	1	None
…communicating at home?	6	9	2	0	Not relevant (3)
…talking to a store clerk who is in a hurry?	8	6	1	2	Focus on speech production (4)
…talking about an emotional issue with family or friends?	9	7	0	1	Not relevant (2)
…ordering a meal in a restaurant?	9	6	1	1	Focus on speech production (1) Not relevant (1)
…trying to persuade a friend or family member to see a different point of view?	9	7	1	0	Focus on speech production (4)
…having a conversation about a serious topic?	10	4	2	1	Not relevant (1)
…talking with family or friends about something you are planning to do with them?	10	7	0	0	Focus on speech production (1)
…starting a conversation with someone you know?	11	5	0	1	Focus on speech production (1) Not relevant (3)
…sharing your opinion with family and friends?	11	5	0	1	Focus on speech production (1) Not relevant (1)
…answering questions from a doctor or health care provider who you know?	12	4	1	0	Focus on speech production (1)
…giving directions to someone who is lost and has asked you for help?	12	3	2	0	Focus on speech production (1) Not relevant (3)
…talking with important people in your life about wishes regarding long-term planning?	14	2	1	0	Not relevant (3)
2. Items of questionable relevance to hearing loss					
…bringing up a new topic in casual conversation?[a]	8	5	2	0	Focus on speech production (3) Not relevant (2)
…asking questions in a conversation?	9	6	2	0	Focus on speech production (7)

(*table continues*)

Table 2. *(Continued).*

2. Items of questionable relevance to hearing loss

Does your condition interfere with…	Not at all	A little	Quite a bit	Very much	Summary of concerns
…comforting a friend or family member?	10	7	0	0	Focus on speech production (3) Not relevant (2)
…giving someone detailed information?	10	5	1	1	Focus on speech production (10)
…getting your point across when you are upset?	11	3	2	1	Focus on speech production (3) Not relevant (6)
…saying something to get someone's attention?	12	3	2	0	Focus on speech production (9)
…communicating when you need to say something quickly?	12	3	2	0	Focus on speech production (10)
…sharing personal feelings with people who are close to you?	12	5	0	0	Focus on speech production (2) Not relevant (4)
…making a witty or funny comment in a conversation?	13	1	0	3	Focus on speech production (3) Not relevant (7)
…if you were with someone you knew and needed to ask them for help right away?	13	2	2	0	Focus on speech production (5) Not relevant (2)
…giving personal advice to help a family member or friend?	13	1	2	1	Focus on speech production (7)
…expressing thanks or appreciation?	16	1	0	0	Focus on speech production (7) Not relevant (5)
3. Items with confusing wording or requiring clarification					
…communicating with others when and where you choose?	4	8	2	3	

Note. Items in Category 1 (relevant to hearing loss) had four or fewer participants raising a concern about the item. Items in Category 2 (of questionable relevance to hearing loss) had five or more participants raising concerns about the item. The reasons for the concerns are summarized in the last column, which include the number of participants (out of 17) in parentheses who raised that concern. Items in Category 3 (confusing wording or requiring clarification) had a unique pattern to the comments elicited by participations in that a majority of participants asked for help in understanding the item. See text for details.

[a]Two participants left this item blank.

Sensitivity to Change With Treatment

When considering their pretreatment status prior to getting hearing aids, the most common responses chosen for items in the short form were *quite a bit* and *very much* (see Table 3), suggesting that participants experienced considerable interference participating in daily communication situations due to their hearing loss. When considering their current status with hearing aids, the most common response categories chosen were *not at all* and *a little,* suggesting less interference in daily communication. Future research is necessary with larger samples to evaluate if these trends are statistically significant, but this preliminary data suggests that response patterns on the CPIB do appear to change with treatment.

Feedback From Focus Group of Audiologists

In general, the patterns in identifying which items were relevant and not relevant to people with hearing loss were similar between the participants with hearing loss and the audiologists in the focus group. Of the 33 items in Table 2 that the individuals with hearing loss identified as relevant to them, the audiologists disagreed with the participants with hearing loss on seven items. Four items were described as not relevant by all of the audiologists ("…talking about an emotional issue with family or friends," "…trying to persuade a friend or family member to see a different point of view," "…sharing your opinion with family and friends," and "…talking with important people in your life about wishes regarding long-term planning"). The audiologists suggested that the topics (e.g., long-term planning or sharing opinion) or context of the situation (e.g., emotional or persuading people) for these items did not cause any more or less difficulty to someone with hearing loss than any other communication situation. However, the audiologists agreed that adding "stressors" to communication situations, such as a noisy environment, a disagreement, or an unfamiliar talker, could create more difficulty for people with hearing loss. All three audiologists commented that the item "…talking with people you know" was not a common problem. The remaining two items ("…talking to

Table 3. Response distributions on the Communicative Participation Item Bank short form by 13 participants asked to recall their experiences in unaided and aided situations.

	Unaided				Aided			
Does your condition interfere with…	**Not at all**	**A little**	**Quite a bit**	**Very much**	**Not at all**	**A little**	**Quite a bit**	**Very much**
…talking with people you know?	1	2	4	5	1	9	2	0
…communicating when you need to say something quickly?	2	2	4	4	8	2	2	0
…talking with people you do not know?	0	0	4	8	0	7	3	2
…communicating when you are out in your community (e.g., errands, appointments)?	0	1	4	7	1	8	2	1
…asking questions in a conversation?	1	2	5	4	4	6	2	0
…communicating in a small group of people?	1	4	3	4	2	7	2	1
…having a long conversation with someone you know about a book, movie, show, or sports event?	2	2	4	4	3	7	2	0
…giving someone DETAILED information?	4	2	2	4	8	2	1	1
…getting your turn in a fast-moving conversation?	0	4	0	8	3	1	3	5
…trying to persuade a friend or family member to see a different point of view?	2	3	4	3	6	5	1	0
Total (sum in each response option)	13	22	34	51	36	54	20	10

a store clerk when in a hurry" and "…giving directions to someone who is lost and has asked you for help") were also identified as not relevant by two of the three audiologists.

The audiologists provided similar feedback as the participants with hearing loss regarding the items in Table 2 listed as not relevant to people with hearing loss. Similar to the participants with hearing loss, the audiologists said that any items that referred specifically to talking were not as appropriate for people with hearing loss because these individuals only have difficulty with hearing, not talking. The focus group participants also noted that the item "…communicating with others when and where you choose" was confusing and needed clarification. Last, the audiologists agreed that more context was desired in some situations, such as if the conversations were at the beginning or end of the day, the number of people in the group, or who their communication partner was.

Discussion

The primary purpose of this study was to conduct cognitive interviews to evaluate if the items in the CPIB are relevant to individuals with hearing loss. Similar patterns in feedback were received from the participants with hearing loss and audiologists. The majority of items on the CPIB were regarded as relevant to individuals with hearing loss, although 12 items were described by participants as having less relevance to their lives. The items that were regarded as less relevant tended to refer specifically to talking, which was not problematic for the participants in this study. Although the two participants with congenital, prelingual hearing loss in this study did not report speech production as part of their communication difficulties, it is possible that speech production is affected by more severe congenital losses. In contrast, most of the items regarded as relevant used terms such as *communicating* or *having a conversation,* which the participants felt better encompassed both speaking and listening. In general, the participants indicated that, with removal of the items that focused specifically on speaking, the remainder of the items would be relevant and useful to include in assessments to understand their experiences with hearing loss.

This study is just the first step in validating the CPIB for use with people with hearing loss. Although this study provides valuable insight into the relevance of the items, the current CPIB item set and scoring format available elsewhere (Baylor et al., 2013) should not be considered valid for use with people with hearing loss at this time. Further studies involving psychometric analyses are needed. A current study is underway to evaluate if the measurement properties of the items, such as item difficulty and item discrimination, differ significantly between people with hearing loss and the prior populations used in development of the CPIB. The CPIB was developed using IRT, and the analysis to evaluate item parameter differences between populations in IRT is an analysis of differential item functioning (DIF; Choi, Gibbons, & Crane, 2011). Prior studies with the CPIB have revealed no meaningful DIF across groups with different speech and language disorders (e.g., Baylor et al., 2016, 2013) as well as between two different countries (Baylor et al., 2014). However, given the patterns observed in the descriptive feedback in this study, it is possible that DIF may be observed between the groups with speech and language disorders versus individuals with hearing loss, particularly on the items that participants with hearing loss found less relevant to their experiences.

On the basis of the combined results of this cognitive interviewing study and psychometric studies that are underway, there are several possible options to enable the CPIB to be used with people with hearing loss. One possibility is that no meaningful DIF will be found between the hearing loss group and prior data sets from people with speech and language disorders. If that were the case, the current CPIB forms and scoring guides could be used with people with hearing loss. Given the descriptive results from this study that suggest several items were identified as not relevant to people with hearing loss, this outcome is not anticipated. A second, and more likely, possibility is that a subset of the CPIB items might be identified as having strong measurement properties for people with hearing loss. In this case, a hearing loss–specific CPIB version could be generated with that subset of items and with its own scoring guide. Given the principle of IRT in that these items relate to the same underlying construct, *t* scores generated by a hearing loss–specific form could be compared directly with *t* scores from the current CPIB short form generated for people with speech and language impairments. This would allow for direct comparisons across the communication disorder groups for either research or clinical purposes. A third possibility is that items that do not have good measurement properties for people with hearing loss could be revised with a new hearing loss instrument created on the basis of those revisions. This would essentially create a new instrument that would be different in content than the existing CPIB, and direct comparison across communication disorders would not be feasible using the CPIB.

Regardless of what quantitative data emerge regarding the measurement properties of the CPIB items in future research, from a descriptive perspective there were strong similarities between the individuals with hearing loss in this study and participants with speech and language impairments in prior studies (Baylor et al., 2011; Garcia, Laroche, & Barrette, 2002) with regards to the types of situations described as being difficult for communication. Participants from these different studies representing different communication disorders shared similarly restricted participation in a variety of environments, including noisy settings, group conversations, fast-paced situations, and the telephone and similar situations in which face-to-face communication is not possible. Recognition of these patterns of difficult communication situations lends support to the need for modifications that would improve physical and social communication environments for the benefit of many people who struggle with a range of different communication barriers. For example, advocacy for reduction of noise in built environments would not only benefit a single communication disorder population, such as those with hearing loss, but would benefit those with speech, language, and cognitive communication challenges as well.

Limitations of this study include the sample size. Although the researchers continued to the point that they felt saturation was reached, it is always possible that additional interviews would have raised new questions or that a particular demographic characteristic was not sufficiently represented. A second limitation is that during the cognitive interviews, participants with hearing aids were asked to answer a subset of the CPIB items according to how they think they would have answered the items before they had hearing loss. Because people's interpretations of their experiences can change over time, it is possible that how they responded to the items retrospectively in this study may not be identical to how they would have answered the items in the past. For this reason, these results are not a definitive indicator of treatment outcomes; however, they do fulfill the purpose of the task in this study to see if the CPIB could be sensitive to changes in participants' perspectives on communicative participation. Last, it should be emphasized that this study in and of itself does not provide sufficient evidence as to whether or not the CPIB is valid for individuals with hearing loss. This study is a first step in that process, and future quantitative research focusing on investigating the psychometric properties of the CPIB for this population are needed.

Conclusion

The purpose of this study was to assess the relevance of the CPIB, which was developed for people with speech and language disorders, to individuals with hearing loss. The results suggest that although a majority of items appear to be relevant to individuals with hearing loss, some items are potentially not relevant, particularly those that specifically refer to speaking. Future psychometric analyses will provide additional information for validating the instrument for people with hearing loss.

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