TechSAge Background Questionnaire: Overview of Measures

Technical Report TechSAge-TR-2001

Rehabilitation Engineering Research Center on
Technologies to Support Aging-in-Place for People with
Long-Term Disabilities (RERC TechSAge)
www.TechSAgeRERC.org

Elena T. Remillard
Patricia C. Griffiths
Jon A. Sanford
Tracy L. Mitzner
Wendy A. Rogers

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Correspondence concerning this report may be addressed to the TechSAge Project Directors:
Jon A. Sanford (jon.sanford@design.gatech.edu),
Wendy A. Rogers (wendyr@illinois.edu)
Tracy L. Mitzner (tracy@gatech.edu)

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Executive Summary

People with long-term disabilities are living longer lives, contributing to growing numbers of older adults with disabilities acquired in early to mid-life (Institute of Medicine, 2007). For these individuals, who are "aging with disability", the combination of age-related declines and health conditions, in addition to pre-existing long-term disability, can create barriers to everyday activity performance and independence (Mitzner, Sanford, & Rogers, 2018). Technology holds great potential to support people aging with disability in maintaining activity performance, participation, health, and quality of life (Agree, 2014). However, successful technology design for this population must be based on a detailed understanding of user characteristics (Scherer, 2005). There is a growing, but limited knowledge base on the characteristics and support needs of people aging with long-term disabilities (e.g., Putnam, Molton, Truitt, Smith, & Jensen, 2016; Remillard, Griffiths, Mitzner, Sanford, Jones, & Rogers, 2020; Vebrugge & Yang, 2002).

The Rehabilitation Engineering Research Center on Technologies to Support Aging-in-Place for People with Long-Term Disabilities (TechSAge) is a collaborative center based at the Georgia Institute of Technology and the University of Illinois Urbana-Champaign. Founded in 2013, TechSAge features multidisciplinary research, development, and training projects that are dedicated to understanding the needs of, and developing supportive technologies for, people aging with long-term disabilities. TechSAge is supported a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (Department of Health & Human Services, Administration for Community Living; Grant # #90REGE0006-01-00).

One of the primary goals of TechSAge is to expand knowledge about the characteristics and support needs of people aging with long-term disabilities. To help achieve this aim,

TechSAge researchers have developed a brief, self-report assessment called the TechSAge Background Questionnaire (TS-BQ). The TS-BQ was developed to streamline collection of key descriptive information about research participants aging with long-term sensory and mobility disabilities. The 43-item questionnaire includes descriptive measures directly relevant to the TechSAge target populations and included socio-demographics, health, memory, as well as functional limitations, and use of aids for vision, hearing, and mobility. This technical report provides an overview of the purpose, development, administration, and measures in the TS-BQ.

1. INTRODUCTION

Increased longevity for people with long-term disabilities represents a relatively new phenomenon that can be attributed to advances in medicine and rehabilitation (Institute of Medicine, 2007). An estimated 12-15 million Americans have a disability acquired prior to the age of 40 (LePlante, 2014). Despite the prevalence of people aging with disability, there are substantial gaps in knowledge about the characteristics of this population. There have been historic silos in aging and disability research, wherein older adults and people with disabilities have been studied as separate populations in distinct field of gerontology/geriatrics and rehabilitation. This phenomenon has resulted in inconsistencies in measures and definitions of disability and consequently limited our understanding of people aging with disability (Remillard et al., 2020). Older adults with long-term disabilities experience the combined effects of aging and having a disability for prolonged period of time. As such, there is a need for convergence in aging and disability measures to better understand the characteristics and support needs of people aging with disability, which can ultimately inform services and supports for these individuals (Putnam, 2014).

There is a growing, but limited knowledge base on the characteristics and support needs of people aging with long-term disabilities (Putnam, Molton, Truitt, Smith, & Jensen, 2016; Remillard, Griffiths, Mitzner, Sanford, Jones, & Rogers, 2020; Vebrugge & Yang, 2002). Our earlier research has demonstrated the remarkable heterogeneity among people aging with disability with regard to co-morbid conditions, personal factors, functional capacity, and use of supportive aids (Remillard, Griffiths, Mitzner, Sanford, Jones, & Rogers, 2020). This research underscores the need for descriptive assessment tools that integrate multidimensional measures from aging and disability literatures to expand our knowledge of this understudied population.

The TechSAge Background Questionnaire (TS-BQ) is a brief, self-report assessment designed to streamline the collection of key descriptive information about individuals aging with long-term sensory and mobility disabilities. The TS-BQ was developed as a tool for use among TechSAge researchers, as it includes descriptive measures directly relevant to TechSAge target populations. Measures include socio-demographics, health, memory, as well as functional limitations, and use of aids for vision, hearing, and mobility. This technical report provides an overview of the 42-item TS-BQ with regard to development, administration, and measures.

2. DEVELOPMENT

The TS-BQ was developed to be a short version of the TechSAge Minimum Battery questionnaire, which is an in-depth, self-report assessment designed to capture a holistic understanding of individuals aging with disability (Remillard, Griffiths, Mitzner, Sanford, Jones, & Rogers, 2020). Now available in its second version, the TechSAge Minimum Battery 2 (TS-MB2) includes just over 100 items and takes approximately 30-40 minutes to complete; contents are detailed in a technical report (Remillard, Griffiths, Sanford, Mitzner, & Rogers, 2021). The TS-BQ takes approximately 15 minutes to complete and essentially represents the first half of the TS-MB2, covering a limited scope of essential, descriptive measures. Minimum Battery 2 measures not featured in the TS-BQ include: activities of daily living, depression, falls, technology experience, and situational capacity for vision, hearing and mobility.

To facilitate the collection of consistent, descriptive data across TechSAge projcts, TechSAge investigators are encouraged to include either the TS-MB2 or the TS-BQ as an assessment in studies supported by TechSAge. The TS-BQ's abbreviated length and streamlined nature of the TS-BQ has made it an ideal tool for collecting participant background information in TechSAge development projects as well as student-led projects, such as theses and

dissertations. The streamlined nature of the TS-BQ also lends itself for broader use among researchers and health professionals beyond TechSAge.

The TS-BQ has undergone extensive pilot testing for clarity and ease of administration. Both the paper and online versions of the TS-BQ were evaluated by materials testers, including student research assistants, staff, and individuals from each target population (older adults with vision, hearing, and mobility disabilities). Through this process, the assessment was refined in terms of formatting and question clarity. We next provide details about the administration options for the TS-BQ.

3. ADMINISTRATION

The TechSAge Background Questionnaire (TS-BQ) is a self-report (43-item) questionnaire that takes approximately 15 minutes to complete. To help facilitate complete responses and prevent skipped questions, all TSBQ questions are required with the option of selecting "Do not wish to answer". The TS-BQ is available in two versions: paper or online.

The TS-BQ was designed to be used as supplemental assessment that researchers can include in their individual studies. As such, there is no standalone protocol, consent form, compensation, or database tied to the TSBQ. Researchers must add the details of the measure to the own Institutional Review Board materials for their specific project.

3.1. Paper Version

The complete paper version of the TS-BQ is provided in the Appendix. The questionnaire is in large print (14 point) font to facilitate readability. Participants who opt to complete the paper version of the TS-BQ by mail should be sent the double-sided questionnaire packet with a self-addressed, pre-paid return envelope.

3.2. Online Version

An online version of the TechSAge Background Questionnaire was developed using

Research Electronic Data Capture (REDCap;

https://redcap.healthinstitute.illinois.edu/surveys/?s=ERCXKYKRYJ) to provide an alternative

option for participants to complete the assessment and to facilitate data entry. Investigators who

express interest in using the TS-BQ are supplied with the REDCap data dictionary, so they can

utilize the online survey questions and database management system for their individual studies.

The online survey can be completed on a computer or tablet and was designed to be screen-

reader accessible to accommodate blind/low vision participants. Additionally, research staff can

input data collected from paper copies of the TS-BQ directly into the online survey. If

participants are unable or prefer not to complete the questionnaire themselves, it can also be

administered to them by a researcher in person or over the phone. Figure 1 displays a screenshot

of TS-BQ questions from the online REDCap survey.

Figure 1
Screenshot of TS-BQ questions from the online REDCap survey

4. MEASURES

The TechSAge Background Questionnaire incorporates a number of measures selected to describe a range of characteristics about the participant population, including demographics, health, vision, hearing, and mobility. To the extent possible, existing assessments were used and/or modified to form the TS-BQ. Table 1 provides an overview of each section of the TS-BQ, with regard to source materials, modifications, and original questions. For each assessment, the content in the TS-BQ (section and question numbers), the source citation, and the version used (i.e., full, select questions) are provided. Detailed information about how source materials were modified are described in the following sections.

Table 1. *Source Materials Included in the TechSAge Background Questionnaire*

TS-BQ Section	Question #	Measure	Source Citation	Version Used
Demographic Information	**2**	sex	U.S. Census Bureau. (2018). Questions Planned for the 2020 Census and American Community Survey. https://www2.census.gov/library/publications/decennial/2020/operations/planned-questions-2020-acs.pdf	select question; modified
	3-8	gender; age; language; education; marital status; race	Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographic and Background Questionnaire (CREATE-2006-02). University of Miami; Florida State University; Georgia Institute of Technology.	select questions; modified
Housing and Transportation	**11**	income	Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographic and Background Questionnaire (CREATE-2006-02). University of Miami; Florida State University; Georgia Institute of Technology.	select questions; modified
	12	transportation mode	U.S. Department of Transportation, Bureau of Transportation Statistics (2003c). Transportation availability and use study for persons with disabilities, 2002. Washington, DC.	select question; modified
Occupational Status	**13**	occupational status	Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographic and Background Questionnaire (CREATE-2006-02). University of Miami; Florida State University; Georgia Institute of Technology.	select question; modified
Health Information	**15-17**	self-rated health	Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographic and Background Questionnaire (CREATE-2006-02). University of Miami; Florida State University; Georgia Institute of Technology.	select questions; exact
	22	cognitive disability	Brault, M. W., & U.S. Census Bureau. (2009). Review of Changes to the Measurement of Disability in the 2008 American Community Survey. Retrieved from: https://www.census.gov/library/working-papers/2009/demo/brault-01.html	
	23	quality of life	Siebens, H.C., Tsukerman, D., Adkins, R.H., Kahan J., Kemp, B. (2015). Correlates of a single-item quality-of-life measure in people aging with disabilities. Am J Phys Med Rehabil, 94:1065-1074. doi: 10.1097/PHM.0000000000000298	exact question
	24	health conditions	Centers for Medicare and Medicaid Services (2012). *Chronic Conditions among Medicare Beneficiaries Chartbook, 2012 Edition*. Baltimore, MD. Fisher, G. G., Faul, J. D., Weir, D. R., & Wallace, R. B. (2005). Documentation of chronic disease measures in the Health and Retirement Study (HRS/AHEAD). *Ann Arbor: University of Michigan.*	sources consulted

TS-BQ Section	Question #	Measure	Source Citation	Version Used
			Andreski, P., McGonagle, K., & Schoeni, R. F. (2009). An analysis of the quality of the health data in the Panel Study of Income Dynamics. PSID Technical Series Paper #09-02. *Ann Arbor, MI: Survey Research Center, Institute for Social Research, University of Michigan.* Kasper, J. D. & Freedman, V. A. (2020) National Health and Aging Trends Study User Guide: Rounds 1-9 Beta Release. *Baltimore: Johns Hopkins University School of Public Health.* Available at www.NHATS.org.	
Vision	25	vision disability	Brault, M. W., U.S. Census Bureau. (2009). Review of Changes to the Measurement of Disability in the 2008 American Community Survey. Retrieved from: http://www.census.gov/people/disability/files/2008ACS_disability.pdf	select question; modified
	27	visual support aids	Hendershot G. E., Larson, S. L., Lakin, K. C. (2003). An overview of the National Health Interview Survey on Disability. In B. M. Altman, S. N. Barnartt, G. E. Hendershot, S. L. Larson (Eds.), *Research in social science and disability, volume 3: Using survey data to study disability: Results from the National Health Interview Survey on Disability* (pp. 9–40). Oxford: Elsevier. Choi, Y. M., Sabata, D., Todd, R. & Sprigle, S. (2008). Building a consumer network to engage users with disabilities. In P. Langdon, J. Clarkson, & P. Robinson (Eds.), *Designing Inclusive Futures* (pp. 55-62). London: Springer. American Academy of Ophthalmology. (2020, July 15). Low Vision Assistive Devices. https://www.aao.org/eye-health/diseases/low-vision-assistive-devices American Federation for the Blind. (2020, July 15). Technology Resources for People with Vision Loss. https://www.afb.org/blindness-and-low-vision/using-technology	sources consulted
Hearing	28	hearing disability	Brault, M. W., U.S. Census Bureau. (2009). Review of Changes to the Measurement of Disability in the 2008 American Community Survey. Retrieved from: http://www.census.gov/people/disability/files/2008ACS_disability.pdf	
	32	hearing support aids	Hendershot G. E., Larson, S. L., Lakin, K. C. (2003). An overview of the National Health Interview Survey on Disability. In B. M. Altman, S. N. Barnartt, G. E. Hendershot, S. L. Larson (Eds.), *Research in social science and disability, volume 3: Using survey data to study disability: Results from the National Health Interview Survey on Disability* (pp. 9–40). Oxford: Elsevier. Choi, Y. M., Sabata, D., Todd, R. & Sprigle, S. (2008). Building a consumer network to engage users with disabilities. In P. Langdon, J. Clarkson, & P. Robinson (Eds.), *Designing Inclusive Futures* (pp. 55-62). London: Springer.	sources consulted

TS-BQ Section	Question #	Measure	Source Citation	Version Used
			Gallaudet University. (2020, July 15). Assistive technologies for Individuals Who are Deaf or Hard of Hearing. https://www3.gallaudet.edu/clerc-center/info-to-go/assistive-technology/assistive-technologies.html	
Mobility	33	mobility disability	Brault, M. W., U.S. Census Bureau. (2009). Review of Changes to the Measurement of Disability in the 2008 American Community Survey. Retrieved from: http://www.census.gov/people/disability/files/2008ACS_disability.pdf	select question; modified
	35	mobility support aids	Hendershot G. E., Larson, S. L., Lakin, K. C. (2003). An overview of the National Health Interview Survey on Disability. In B. M. Altman, S. N. Barnartt, G. E. Hendershot, S. L. Larson (Eds.), *Research in social science and disability, volume 3: Using survey data to study disability: Results from the National Health Interview Survey on Disability* (pp. 9–40). Oxford: Elsevier.	sources consulted
			Choi, Y. M., Sabata, D., Todd, R. & Sprigle, S. (2008). Building a consumer network to engage users with disabilities. In P. Langdon, J. Clarkson, & P. Robinson (Eds.), *Designing Inclusive Futures* (pp. 55-62). London: Springer.	

4.1. Demographic Information

The Demographic Information section includes 8 questions about population characteristics, assessing: gender, age, language, education, marital status, and race. The first question assesses who is completing the survey on behalf of the participant (#1). This original question was added by the developers of the TS-BQ, recognizing that participants with sensory and mobility disabilities may require assistance to complete the questionnaire. The question assessing sex was modified from the 2020 U.S. Census questionnaire (U.S. Census Bureau, 2018). In addition to the options 'male' and 'female', participants have the option to select 'other' (#2). The remaining questions include modified items from the demographics portion of the Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographics and Background Questionnaire (Czaja et al., 2006). Questions were modified in terms of format and response options, but the central aims of questions are consistent. For example, the CREATE question, "Is English your primary language? If no, what is?", was modified to ask, "What is your preferred language for communicating?". The modified question is now multiple-choice with the following response options: English, Spanish, American Sign Language and Other (#4). A follow-up question was added to assess additional languages the respondent is fluent in.

4.2. Housing and Transportation

The first 2 questions in this section are original items (#9-10). Question 9 assesses with whom the respondent lives (if anyone); check-all-that-apply response options include "live alone" as well different types of relationships (e.g., spouse or partner, other family, roommate or friend). In Question 10, respondents are asked whether or not their housing or community is specifically designed for seniors (ages 55+). If "Yes", they are asked to specify the option that

best describes their housing from a list that includes types of senior housing communities (e.g., independent living, assisted living). Respondents are also asked to specify their annual household income using a question from the CREATE Demographics and Background Questionnaire (#11; Czaja et al., 2006). A question from the Bureau of Transportation Statistics Transportation Availability and Use Survey (2002) was included to assess transportation modes utilized in the past month (#12; U.S. Department of Transportation, Bureau of Transportation Statistics, 2003c). The response options for this check-all-that-apply question were modified to include 'Ride Share (e.g., Uber, Lyft)' and to exclude 'School Bus'.

4.3. Occupational Status

Question 13 is modified question from the CREATE Demographics and Background Questionnaire, which assesses whether the respondent is currently employed or working for pay (Czaja et al., 2006). If the respondent selects that that are employed full or part time, they are asked to specify their occupation (fill-in-the-blank). If the response is 'No' (not employed), respondents are asked to check-all-that-apply regarding their current status (e.g., retired, student, homemaker, unemployed). Question 14 is an original question wherein respondents are asked to specify if they currently receive certain types of disability benefits, including Social Security Disability Income and Veterans Affairs (VA) Disability Benefits.

4.4. Health Information

The Health Information section includes questions about perceived health, memory, medication usage, quality of life and health conditions. The first few questions are select self-rated health questions from the CREATE Demographics and Background Questionnaire, which are included verbatim (#15-17; Czaja et al., 2006). For each question, the respondent rates different aspects of their own health, including: health in general; health in comparison to others

your own age; how often health problems stand in the way of you doing the things that you want to do. Response options are on a five-point scale that varies by question. Modeling the same format of these self-rated health questions from Czaja et al (2006), questions 19-21 are original items that ask respondents to rate different aspects of their own memory. Questions assess: memory in general; memory in comparison to others your own age; how often does your memory stand in the way of you doing the things that you want to do. The same 5-point response scales as the self-rated health questions are used. Question 18 is an original question, wherein respondents are asked to write in the number of different prescription medications they take each day (#18). Question 22 is the cognitive disability question from the U.S. Census Bureau's American Community Survey (ACS) Disability Questions assessing difficulty with concentrating, remembering, or making decisions (Brault, 2009; #22). This section also features a single-item Quality of Life (QoL) measure designed for people aging with disabilities (Siebens, Tsukerman, Adkins, Kahan, & Kemp, 2015). Respondents are asked to rate their current Quality of Life using a 7-point scale (1 = life is very distressing; 4 = life is so-so; 7 = life is great).

Lastly, the Health Information section includes a checklist table of health conditions (#24). The table includes 18 conditions identified by members of the TechSAge team as most relevant to the TechSAge target populations, who broadly include older adults aging with long-term vision, hearing, and mobility disabilities. The list was not designed to be exhaustive, but rather to represent key disabling conditions and co-morbidities of interest to specific research efforts in four primary categories: motor/mobility, cognitive, vision, and other chronic conditions. In addition to eliciting research staff input, the developers of this list reviewed health conditions questions from several nationally representative surveys to guide item selection. Sources included the Chronic Conditions among Medicare Beneficiaries Chartbook, the Health

and Retirement Study (HRS); the Panel Study of Income Dynamics; and the National Health and Aging Trends Study (Centers for Medicare and Medicaid Services, 2012; Fisher, Faul, Weir, & Wallace, 2005; Andreski, McGonagle, & Schoeni, 2009; Kasper & Freedman, 2020). Conditions are presented in alphabetical order in a checklist format. For the cataracts question (#24d), respondents who select 'Yes' are presented with a follow-up question, 'Have you had your cataracts removed?". Lastly, respondents have the option to write in any other conditions they have which are not included on the list.

4.5. Vision

The Vision section begins with a modified version of the Vision Disability question from the U.S. Census Bureau's American Community Survey (ACS) Disability Questions, which asks "Do you have serious difficulty seeing, even when wearing glasses or contact lenses?" (Brault, 2009; #25). The question was modified in several ways due to issues that emerged in using the original question in the first version of the TechSAge Minimum Battery (Remillard, Griffiths, Mitzner, Sanford & Rogers, 2020). The first modification is that the question is includes the response option "Unable to see'. This modification was deemed necessary as our research team discovered that some blind individuals who completed the assessment reported "No", not having serious difficulty seeing, because they are unable to see at all. In the modified questions, respondents who report "Yes" (serious difficulty) or "Unable to see", are asked two follow-up questions to assess if the vision impairment affects one or both eyes and approximately how old they were when they first had serious difficulty seeing (write-in).

Question 26 is an original question wherein participants are asked if they have been told by a medical professional if they are blind or low vision. Finally, respondents are presented with a list of 12 common visual support aids and are asked to check all that they currently use (#27).

The list of visual support aids was developed through input from subject matter experts (e.g., low vision rehab specialists, occupational therapists, ophthalmologists). Other source materials reviewed include: the National Health Interview Survey on Disability (NHIS-D); the CATEA Consumer Network (CCN) registry questionnaire, developed by researchers at the Center for Assistive Technology and Environmental Access (CATEA) at the Georgia Institute of Technology; as well as online resources from national vision organizations (Hendershot, Larson, & Lakin, 2003; Choi, Sabata, Todd, & Sprigle, 2008; American Academy of Ophthalmology, 2020; American Federation for the Blind, 2020). Respondents have the option to check 'other' and write in any visual support aids they use which are not included on the list.

4.6 Hearing

Question 28 is modified version of the Hearing Disability question from the U.S. Census Bureau's American Community Survey (ACS) Disability Questions, which asks "Do you have serious difficulty hearing?" (Brault, 2009). Similar to modifications of the ACS vision question, the response option "Unable to hear" was also added. Respondents who report "Yes" (serious difficulty) or "Unable to hear", are asked two follow-up questions to assess if the hearing impairment affects one or both ears and approximately how old they were when they first had serious difficulty hearing (write-in).

Questions 29-31 are original items designed to assess more detail about participants' hearing, with regard to a medical diagnosis of deaf or hard of hearing, use of hearing aids, and to what extent they use American Sign Language (if at all). In Question 32, respondents are presented with a list of 15 common hearing support aids and are asked to check all that they currently use. The list of hearing support aids was developed through input from subject matter experts (e.g., audiologists, individuals who are deaf or hard of hearing, and staff with expertise in

deaf and hard of hearing communication). Other source materials reviewed include the National Health Interview Survey on Disability (NHIS-D); the CATEA Consumer Network (CCN) registry questionnaire; as well as online resources from and the Laurent Clerc National Deaf Education Center at Gallaudet University (Hendershot, Larson, & Lakin, 2003; Choi, Sabata, Todd, & Sprigle, 2008; Gallaudet, 2014). Respondents have the option to check 'other' and write in other hearing support aids they use which are not included on the list.

4.7 Mobility

Question 33 is modified version of the Mobility (Ambulatory) Disability question from the U.S. Census Bureau's American Community Survey (ACS) Disability Questions, which asks "Do you have serious difficulty walking or climbing stairs?" (Brault, 2009). The response option "Unable to walk" was added. Respondents who report "Yes" (serious difficulty) or "Unable to walk", are asked approximately how old they were when they first had serious difficulty walking or climbing stairs (write-in). The following question is an original item to assess if respondents are able to walk independently without using a walking aid (e.g., cane, walker, crutches; #34). Finally, the survey concludes with a list of 13 common mobility support aids and are asked to check all that they currently use (#35). The list of mobility support aids was developed through input from subject matter experts (e.g., staff with expertise in physical therapy and rehabilitation science). Other source materials reviewed include the National Health Interview Survey on Disability (NHIS-D) and the CATEA Consumer Network (CCN) registry questionnaire (Hendershot, Larson, & Lakin, 2003; Choi, Sabata, Todd, & Sprigle, 2008). Respondents have the option to check 'other' and write in other mobility support aids they use which are not included on the list.

5. CONCLUSION

TechSAge is dedicated to understanding the needs of, and developing supportive technologies for, individuals aging with long-term disabilities. The TechSAge Background Questionnaire (TS-BQ) was developed to provide researchers with a brief, streamlined tool to gather key descriptive background and disability-related information from research participants. The 42-item, self-report questionnaire is comprised of a variety of measures including: socio-demographics, health, memory, as well as functional limitations, and use of aids for vision, hearing, and mobility. The TS-BQ represents the short version of the TechSAge Minimum Battery 2, which is an in-depth background questionnaire (Remillard et al., 2021). TechSAge investigators and students are encouraged to include TS-BQ as an assessment in their individual studies to promote the collection of consistent background information across projects. Beyond TechSAge, the TS-BQ could serve as a valuable assessment tool for researchers conducting studies with aging and disability populations.

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APPENDIX: TECHSAGE BACKGROUND QUESTIONNAIRE

TechSAge Background Questionnaire

RERC TechSAge

Rehabilitation Engineering Research Center on Technologies to Support Aging-in-Place for People with Long-Term Disabilities

Revised 02-06-2022

This questionnaire asks you to provide information about various aspects of yourself, including your abilities and limitations. These questions were designed to cover a broad range of individuals with different types of abilities and limitations. Please answer these questions in terms of your general abilities and limitations in your daily life. We realize that some of these questions may be sensitive in nature. Every question requires a response, but you can select 'Not Applicable' or 'Do not wish to answer'.

Thank you in advance for your help.

Demographic Information

1. Who are you completing this survey for?

   I am…
   $\square_1$ Entering the responses for myself
   $\square_2$ Entering the responses for someone else with their answers
   $\square_3$ Entering the responses for someone else based on my experience with them
   $\square_{88}$ *Do not wish to answer*

2. What is your sex?
   $\square_1$ Male
   $\square_2$ Female
   $\square_3$ Other (please specify) _____
   $\square_{88}$ *Do not wish to answer*

3. What is your age? _____

4. What is your preferred language for communicating? (Choose one).

   $\square_1$ English
   $\square_2$ Spanish
   $\square_3$ American Sign Language
   $\square_4$ Other (please specify)_____
   $\square_{88}$ *Do not wish to answer*
   　b. What other languages are you fluent in? (Check all that apply).
   $\square_1$ English
   $\square_2$ Spanish
   $\square_3$ American Sign Language
   $\square_4$ Other (please specify)_____
   $\square_0$ None
   $\square_{88}$ *Do not wish to answer*

5. What is your highest level of education? (Choose one).

   $\square_1$ No formal education
   $\square_2$ Less than high school graduate
   $\square_3$ High school graduate/GED
   $\square_4$ Vocational training
   $\square_5$ Some or in-progress college/Associate's degree
   $\square_6$ Bachelor's degree (BA, BS)
   $\square_7$ Master's degree (or other post-graduate training)
   $\square_8$ Doctoral degree (PhD, MD, EdD, DDS, JD, etc.)

$\square_{88}$ *Do not wish to answer*

6. What is your current marital status? (Choose one).

   $\square_1$ Single
   $\square_2$ Married
   $\square_3$ Separated
   $\square_4$ Divorced
   $\square_5$ Widowed
   $\square_6$ Other (please specify) _____
   $\square_{88}$ *Do not wish to answer*

7. Do you consider yourself Hispanic or Latino?

   $\square_1$ Yes $\square_0$ No $\square_{88}$ *Do not wish to answer*

8. How would you describe your primary racial group? (Choose one).

   $\square_1$ American Indian/Alaska Native
   $\square_2$ Asian
   $\square_3$ Native Hawaiian or Other Pacific Islander
   $\square_4$ Black or African American
   $\square_5$ White
   $\square_6$ More than one race
   $\square_7$ Other (please specify) _____
   $\square_{88}$ *Do not wish to answer*

Housing and Transportation

9. With whom do you live? (Check all that apply).

   $\square_1$ Live alone
   $\square_2$ Spouse or partner
   $\square_3$ Other family
   $\square_4$ Roommate or friend
   $\square_4$ Other (please specify) _____
   $\square_{88}$ *Do not wish to answer*

10. Is your housing or community specifically designed for seniors (i.e., 55 and older)?

    $\square_1$ Yes $\square_0$ No $\square_2$ Not sure $\square_{88}$ *Do not wish to answer*

b. If yes, select the option that best describes your community:

☐ Independent Living Facility
☐ Assisted Living Facility
☐ Skilled Nursing Facility
☐ Continuing Care Retirement Community (CCRC)
☐ Other (please specify) _____
☐ *Do not wish to answer*

11. Which category best describes your yearly household income? (Choose one).

☐$_1$ Less than $25,000
☐$_2$ $25,000 - $49,999
☐$_3$ $50,000 - $74,999
☐$_4$ $75,000 or more
☐$_5$ Do not know for certain
☐$_{88}$ *Do not wish to answer*

12. What modes of transportation have you used <u>in the past month</u>? (Check all that apply).

☐$_1$ Personal vehicle (driver)
☐$_2$ Personal vehicle (passenger)
☐$_3$ Carpool, vanpool
☐$_4$ Public bus
☐$_5$ ADA Para-transit service
☐$_6$ Other specialized services
☐$_7$ Private or chartered bus
☐$_8$ Rideshare (e.g., Uber, Lyft)
☐$_9$ Subway/light rail/commuter rail
☐$_{10}$ Taxicab
☐$_{11}$ Electric wheelchair, scooter, golf cart
☐$_{12}$ Bike
☐$_{13}$ Walk
☐$_{14}$ Other (please specify) _____
☐$_{88}$ *Do not wish to answer*

Occupational Status

13. Are you currently employed/working for pay? (Choose one)
- $\square_0$ No
- $\square_1$ Employed part-time   Occupation? _____
- $\square_2$ Employed full-time   Occupation? _____
- $\square_{88}$ *Do not wish to answer*

13 b. If <u>no</u>, check all that apply about your current status
- $\square_1$ Retired
- $\square_2$ Student
- $\square_3$ Homemaker
- $\square_4$ On maternity or sick leave
- $\square_5$ On disability leave (short-term)
- $\square_6$ Unemployed or temporarily laid off
- $\square_7$ Other (please specify) _____
- $\square_{88}$ *Do not wish to answer*
- $\square_{99}$ *Not applicable*

14. Are you currently receiving any of the following disability benefits? (Check all that apply).
- $\square_1$ SSDI (Social Security Disability Income)
- $\square_2$ VA (Veterans Affairs) Disability Benefits
- $\square_3$ Do not currently receive any of these
- $\square_{88}$ *Do not wish to answer*

Health Information

15. In general, would you say your health is:

$\square_1$	$\square_2$	$\square_3$	$\square_4$	$\square_5$	$\square_6$
Poor	Fair	Good	Very Good	Excellent	*Do not wish to answer*

16. Compared to other people your own age, would you say your health is:

$\square_1$	$\square_2$	$\square_3$	$\square_4$	$\square_5$	$\square_6$
Poor	Fair	Good	Very Good	Excellent	*Do not wish to answer*

17. How often do health problems stand in the way of you doing the things you want to do?

☐1	☐2	☐3	☐4	☐5	☐88
Never	Seldom	Sometimes	Often	Always	*Do not wish to answer*

18. How many different **prescription medications** do you take each day?

_____

19. In general, would you say your memory is:

☐1	☐2	☐3	☐4	☐5	☐6
Poor	Fair	Good	Very Good	Excellent	*Do not wish to answer*

20. Compared to other people your own age, would you say your memory, is:

☐1	☐2	☐3	☐4	☐5	☐6
Poor	Fair	Good	Very Good	Excellent	*Do not wish to answer*

21. How often does your memory stand in the way of you doing the things you want to do?

☐1	☐2	☐3	☐4	☐5	☐88
Never	Seldom	Sometimes	Often	Always	*Do not wish to answer*

22. Do you have SERIOUS difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition?

☐1 Yes   ☐0 No   ☐88 *Do not wish to answer*

23. Taking everything in your life into account, please rate your current overall Quality of Life on the following 7-point scale.

☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐88
Life is very distressing			Life is so-so			Life is great	*Do not wish to answer*

24. Please indicate if you have any of the following conditions (presented in alphabetical order). Check all that apply.

	Condition
☐	a. Alzheimer's disease or other dementia
☐	b. Amputation
☐	c. Arthritis
☐	d. Cataracts
☐	If yes, have you had your cataracts removed? ☐$_1$ Yes ☐$_0$ No ☐$_{88}$ *Do not wish to answer*
☐	e. Cerebral Palsy
☐	f. Coronary or Heart Condition
☐	g. Diabetes or High Blood Sugar
☐	h. Glaucoma
☐	i. Hypertension or High Blood Pressure
☐	j. Macular Degeneration
☐	k. Mild Cognitive Impairment
☐	l. Multiple Sclerosis (MS)
☐	m. Parkinson's Disease
☐	n. Post-Polio syndrome
☐	o. Spina Bifida
☐	p. Spinal Cord Injury
☐	q. Stroke/Transient Ischemic Attack
☐	r. Traumatic Brain Injury (TBI)
☐	s. Other? (If yes, please specify) _____ _____ _____
☐	t. None of the above
☐	*Do not wish to answer*

Vision/Hearing/Motor Capabilities
Please describe your <u>vision</u>, in general, by answering the following questions.

25. a. Do you have SERIOUS difficulty seeing, <u>even when wearing</u> glasses or contact lenses?

    ☐1 Yes   ☐0 No   ☐2 Unable to see   ☐88 *Do not wish to answer*

    <u>If Yes OR Unable to see:</u>
    b. with one eye or both eyes?
    ☐1 One eye   ☐2 Both eyes ☐88 *Do not wish to answer*

    c. how old were you when you first had SERIOUS difficulty seeing (best guess)? _____

26. Have you been told by a medical professional that you are any of the following?
    ☐1 Blind
    ☐2 Low Vision
    ☐3 None of the above

    ☐88 *Do not wish to answer*

27. Do you NOW use any of the following? (Check all that apply)
    ☐1 Audio description
    ☐2 Braille
    ☐3 Glasses or contact lenses
    ☐4 Guide dog
    ☐5 Reading magnifier
    ☐6 Reader service
    ☐7 Scanner
    ☐8 Screen reader or magnifier
    ☐9 Sighted guide
    ☐10 Telescopic lenses
    ☐11 White cane
    ☐12 Other, please specify: _____
    ☐0 Do not use any
    ☐88 *Do not wish to answer*

Please describe your <u>hearing</u>, in general, by answering the following questions.

28. Do you have SERIOUS difficulty hearing, even when wearing a hearing aid?

☐₁ Yes   ☐₀ No   ☐₂ Unable to hear   ☐₈₈ *Do not wish to answer*

<u>If Yes OR Unable to hear:</u>

    b. In one ear or both ears?

       ☐₁ One ear   ☐₂ Both ears   ☐₈₈ *Do not wish to answer*

    c. How old were you when you first had SERIOUS difficulty hearing (best guess)? _____

29. Have you been told by a medical professional that you are:
☐₁ Deaf
☐₂ Hard of Hearing
☐₃ None of the above
☐₈₈ *Do not wish to answer*

30. In the last month, have you used a hearing aid or other hearing device?

☐₁ Yes   ☐₀ No   ☐₈₈ *Do not wish to answer*

31. Do you use American Sign Language?

☐₁ Not at all
☐₂ A little bit
☐₃ Most of the time
☐₄ All of the time
☐₈₈ *Do not wish to answer*

32. Do you NOW use any of the following? (Check all that apply).
☐₁ Assistive listening devices (e.g., personal headphones)
☐₂ Assistive signaling/alerting devices (e.g., doorbell flashing light)
☐₃ Automated voice-to-text software
☐₄ Closed caption television (CCT)
☐₅ Cochlear implant
☐₆ FM (Frequency Modulation) system or Loop system
☐₇ Hearing aid
☐₈ Interpreter services (e.g., sign language or oral interpreting)

☐9 Real-time captioning (e.g., CART)
☐10 Telecommunication relay service (TRS) (e.g., CapTel)
☐11 Telephone amplifier
☐12 TDD, TTY, or Teletype
☐13 Videoconference or video calling (e.g., Facetime, Skype, Zoom)
☐14 Video Relay Service (VRS) (e.g., Sorenson, Purple, ZVRS)
☐15 Video Remote Interpreting (VRI)
☐16 Other, please specify _____
☐0 Do not use any
☐88 *Do not wish to answer*

Please describe your <u>physical mobility</u>, in general, by answering the following questions.

33.   Do you have SERIOUS difficulty walking or climbing stairs?

☐1 Yes   ☐0 No   ☐2 Unable to walk   ☐88 *Do not wish to answer*

   b. <u>If Yes or Unable to walk:</u> how old were you when you first had difficulty walking (best guess)? _____

34.   Are you able to walk independently <u>without</u> using a walking aid (e.g., cane, walker, crutches)?

☐1 Yes   ☐0 No   ☐88 *Do not wish to answer*

35.   Do you NOW use any of the following? (Check all that apply)

☐1 Cane or walking stick
☐2 Crutches
☐3 Grab bars
☐4 Grabber/Reacher
☐5 Knee walker
☐6 Lift chair
☐7 Manual wheelchair
☐8 Orthotic device (e.g., braces)
☐9 Power/Electric wheelchair
☐10 Prosthetic device (e.g., artificial limb)
☐11 Scooter
☐12 Service dog
☐13 Walker or rollator

☐$_{14}$ Other (please specify) _____

☐$_0$ Do not use any

☐$_{88}$ *Do not wish to answer*